was at least 35 tons. Persistent reports of expanded poppy cultivation in the highlands of Latin America suggest that production in this area is rising. According to one estimate, accepted by the BNDD, the opium needed to supply the entire U.S. addict population could be grown on as little as 10 square miles of suitable land.

The heroin supply system has a flexibility and economic vitality that presents problems for enforcers. According to Parker of the BNDD, the strategy is to apply pressure at all parts of the system with the aim of raising the risk to unacceptable levels for traffickers and driving heroin addicts into maintenance programs. "The hope is that you can price people out of the system," says Laster, R & D subcommittee chairman of the Committee on International Narcotics Control. "There are optimal locations in terms of transportability. You may be able to cause the system enough trouble at these points to throw it out of balance."

Laster believes that at each step of the supply route there are opportunities for technology to be brought to bear. "Innovation is at a premium in this job and I would welcome ideas from the academic and industrial community," he says. And Frederick Garfield, BNDD assistant director for scientific support, sees the interdiction of heroin supplies as a "tremendous responsibility for the scientific community."

Technology, and the law enforcement processes to which it is an adjunct, are unlikely to provide an answer to the problem of heroin addiction. But the technical initiatives under way and in application offer at least a small handle on a large problem.

—NICHOLAS WADE

Medicine at Michigan State (I): Educators and Legislators

In the 1960's, Michigan was one of the states which responded to growing public concern about health care by mounting a major expansion of medical education. The federal government contributed substantially to this expansion, particularly with construction grants and funds for biomedical research. But state legislators found themselves called on to vote matching funds for construction projects and to provide big operating budgets for expanded programs. They learned that medical education is very costly.

In recent years two things have happened to alter the postwar pattern: (i) Medical schools have suffered from the squeeze on federal spending, particularly the squeeze on construction funds, and (ii) medical education has encountered increasing competition for state funds from other programs such as welfare, housing, and recreation, not to mention other sectors of the health and education budgets.

During this period, not only did costs rise precipitously, but key Michigan legislators began to feel that promises of progress made to them by medical school officials were not being fulfilled. The result has been a growth of sophistication and skepticism which seems to be affecting very significantly the way in which the legislature deals with medical education.

There are four medical schools in Michigan, all of them state schools. The University of Michigan at Ann Arbor and Wayne State University in Detroit each has a medical school. Michigan State University at East Lansing has two medical schools, one of them the first state school of osteopathic medicine on a university campus.

The main concern of Michigan legislators has been a shortage of doctors in rural and inner-city areas and the loss to other states of doctors trained in state medical schools. The problem is not unique to Michigan, but legislators note that after more than a decade of heavy investment in medical education their constituents are still complaining, if anything more bitterly, about a doctor shortage. The legislators wanted more doctors, especially more family doctors in small towns and cities, and what they think they have gotten is more researchers and more specialists who settle in the big cities or emigrate to California.

Until the late 1950's the situation in Michigan was relatively uncomplex. The University of Michigan operated the only state medical school and seemed to get pretty much what it asked from the legislature. Then in 1956 the state took over Wayne in Detroit, which had been run by the city and was essentially a struggling streetcar university with an underfinanced medical school. Observers say it was not until 1964 that the legislature really backed Wayne's expansion and then with the understanding that the medical school would increase class size drastically and emphasize training physicians to serve the inner city.

In the case of Michigan State the preliminaries were protracted. MSU had undergone a rapid postwar metamorphosis. From an overgrown state college known for turning out veterinarians, ag students, and teachers, it became an upwardly mobile university with a wide range of graduate programs. The expansion was presided over by John A. Hannah, a man of legendary entrepreneurial talents and drive. MSU moved so fast that it bypassed building the professional schools of medicine and law that traditionally round out a major university. Getting medical education on the MSU campus was to cap Hannah's career as an institution builder, but the goal was won after strong resistance by the legislature and long delay and was finally achieved, close observers say, under a compromise in which acceptance of a college of osteopathic medicine in tandem with a school training M.D.'s was a necessary element.

The legislature's leverage in dealing with medical schools is exerted, not surprisingly, through the power of the purse, and the fulcrum is the appropriations committees of the state senate and house. But the mechanism that sets Michigan apart from other states is a joint capital outlay committee. This is a six-member body—three from the senate, three from the house—which examines proposals for new state-funded capital construction and

makes recommendations which are almost always accepted by the legislature.

Chairman of the joint capital outlay committee is Democratic State Senator Garland Lane; the two ranking members are Republican Senator Charles Zollar, chairman of the senate appropriations committee, and Representative William Copeland, a Democrat who is chairman of the house appropriations committee. Lane and others say the committee's effectiveness is traceable mainly to a willingness to work. Most committees in state legislatures manage relatively little time for hearings and committee sessions. The joint capital outlay committee meets 80 to 100 times a year, working nights during legislature sessions and meeting at the capital or on the road when the legislature is out of session. The committee's hearings and site visits are far from perfunctory.

The committee influence in the narrowly divided senate—Democrats control the house, Republicans the senate—is attributed to the easy working relationship between Lane and Zollar, and the committee as a whole has a reputation for expertise and for keeping partisanship to a minimum. The interests of the members vary, and members are able to bring a wide range of knowledge and experience to bear on building proposals. Lane is the acknowledged expert on education and has taken a special interest in medical education and mental health programs.

Legislators agree that the committee began to hit its stride in the middle 1960's. In addition to the long hours, the committee, as Copeland puts it, "has a good staff. They can really bird-dog. They're not political hacks." For several years the committee's principal staff man has been a trained engineer, and the committee has drawn heavily on the analysts of the house and senate fiscal agencies. Often mentioned as an influential former staff member is Gerald Faverman, who came to the staff from a post as a college history teacher. Faverman, as one observer put it, "understands the numbers, the politics, and the programs," and helped the committee gain some new insights into medical education. Faverman is now an assistant for planning to the dean of the College of Human Medicine at MSU.

The committee has recently used the services of a health care planning and consulting firm based in California. Originally the firm was engaged by Wayne State, but the committee found the firm's experience and perspective helpful in dealing with medical education matters.

Since the middle 1960's the legislators have sought to move beyond their old role of simply ratifying or rejecting proposals by the medical schools. They have sought in at least a limited way to manipulate the system. Their interests center mainly on manpower—they want to increase the number of medical graduates, and they want to see these graduates stay in Michigan. They are increasingly concerned with reasons for the decline in the output of family physicians and they are beginning to ask for detailed explanations of the cost of medical education. In other words, the legislators are beginning to be more interested in programs than in promises.

Question of Influence

How successful have the legislators been in influencing the medical schools? The results appear mixed. Class size has increased substantially. Michigan and Wayne State each is reaching a level of some 240 entering freshmen (for Wayne State this represents a fourfold increase since 1964). Legislators are still not happy with the management of medical education at Wayne State. There was friction between the university administration and the legislators, and Wayne State's president was ultimately forced out. As for the medical school, the legislators felt that the school was not carrying through fast enough on promises to increase class size and to train a new breed of doctors for service in the inner city. The medical school faced real problems in doubling and redoubling class size, moving into new facilities, and bringing faculty around to accept a somewhat altered mission. The current view in the legislature seems to be that things are going better.

The medical school at the University of Michigan is solidly rooted and more resistant to influence from Lansing. Legislators' attitudes toward U. of M. tend to be ambivalent. They resent the university's elitist aura and tendency to go its own way. But there is evident pride in Michigan's prestige. When talking to outsiders even the critics tend to call it "the Harvard of the Midwest." The increase in enrollment of medical students at U. of M. is viewed as an accommodation to the wishes of the legislators; on the other hand the legislators seem to have tacitly accepted that U. of M. will continue to be predominantly a research-oriented medical school, training a large proportion of its products for academic medicine or the specialities.

The legislators' influence has probably been felt most directly at MSU. This is hardly surprising since the medical school was just starting out and the legislature could exercise control through building funds. The idea of medical education as a serious possibility at MSU dates back at least to the middle 1950's. But the sine qua non was support by the legislature and this took more than a decade in coming. MSU ambitions for a medical school had a fairly solid logical grounding since the university already had a school of nursing and a training program in medical technology, taught such things as dietetics and clinical psychology, and offered a range of relevant courses in the big education program. More to the point, the College of Veterinary Medicine's relationships to the university's science departments provided a tradition of joint administration and academic cooperation on which to build. Through ensuing negotiations MSU officials stressed the close integration of medical education with existing departments, particularly in the basic sciences.

The legislature, however, was far from convinced of the need for another state medical school and dug in its heels against duplicating another expensive set of medical teaching, research, and care facilities. There was also strong opposition from the other medical schools, which saw resources being siphoned off, and the University of Michigan was particularly adamant. MSU persisted, however, and in the early 1960's created an Institute of Biology and Medicine to handle the planning and coordination for the new school. Then, in 1964, Andrew Hunt came to MSU from the Stanford medical center, where he had headed the ambulatory care program, to be dean of a new College of Human Medicine. The name was apparently chosen in deference to the College of Veterinary Medicine. A decision was made to go ahead and establish a 2-year medical school, an idea which was fashionable at the time and one which made it conveniently feasible to avoid the heavy expenses of clinical training. The first entering class arrived in September of 1966 for the 2-year program which actually was a 3-year program since a

first year designed to provide a transition from undergraduate to professional school was added.

Before the school even opened its doors, however, efforts to win approval for expansion to a full, 4-year program granting the M.D. degree were under way. Recruits to the faculty, as a matter of fact, were given to understand that a move to a 4-year program was just a matter of time. The extraordinary thing was that the medical school was launched without state funds and was financed with federal, private, and university funds—a remarkable feat, but not one accomplished without the faculty feeling the pinch. The campaign for state support is described as "a fight between John Hannah and Gar Lane." The legislature finally did approve the 4-year school and voted funds for expansion in 1969, the year that Hannah resigned from MSU presidency to join the Nixon Administration as AID Administrator. State aid was provided on the understanding that the new school would make maximum use of community facilities for clinical training and would put strong emphasis on family medicine. Not only was the model of the university medical center deliberately eschewed, but close observers say that the bargain was sealed on the basis that the College of Human Medicine would not only accept a College of Osteopathic Medicine on campus but would share facilities and genuinely cooperate with it.

This denouement was clearly influenced by the strength of the osteopaths in Michigan, which seems to be due to circumstances existing in few other states. Although doctors of osteopathic medicine (D.O.'s) have been fully licensed in Michigan since the first decade of the century, until World War II there were only a few hundred practicing in the state; and as late as the 1930's many of them, as one D.O. put it rather hyperbolically, "were starving to death." Then, however, in World War II osteopaths were not drafted into the military medical services and in the wartime doctor shortage D.O.'s in Michigan provided needed medical care and gained a broad measure of public acceptance. A number of osteopathic hospitals were established and more osteopaths were attracted to the state. Probably the strongest factor in the continued rise of the osteopaths after the war was that a majority of them were general practitioners, whereas increasing numbers of M.D.'s entered the specialties or migrated out of shortage areas. There are said to be more osteopaths in Michigan than in any other state—more than a tenth of the estimated 13,000 in practice in the nation. In Michigan the D.O.'s are concentrated in the cities and smaller towns of the industrialized south and are spotted around in some more isolated rural areas. D.O.'s make up an estimated 17 percent of physicians in Michigan and a third of general practitioners.

As a medical minority group the D.O.'s tend to be cohesive and hypersensitive about second-class medical status. The D.O.'s, however, are popular in the legislature, and when they decided they needed state support for a school of osteopathic medicine they were able in the showdown to outlobby M.D.'s. The D.O.'s benefited, as a matter of fact, from what Lane and Copeland and others in Lansing describe as the current unpopularity of M.D.'s in Michigan. The M.D.'s, according to one observer, are resented for leaving the small towns without doctors and for profiting from Medicare and Medicaid. Or as he pithily put it, "they dropped their charity lists and became rich and hated." To an outsider all this seems unfair or at least overstated, but the unpopularity of M.D.'s is unmistakably a fact of political life.

There has never been a school of osteopathic medicine in Michigan, and by the early 1960's the D.O.'s initiated plans for a private school. They obtained a charter from the state board of education, and raised funds privately including substantial pledges from most D.O.'s. Citizens of the city of Pontiac raised more than $400,000 for a site for the school, and by 1969 the first facilities were open and a first class of 20 students was enrolled. The next year a class of 25 was admitted but it was becoming increasingly clear that state support was required if the school was to be viable.

The D.O.'s had begun seeking state funds in earnest several years before and in 1964 had received some $50,000 for planning money. The D.O.'s really wanted the state to take over financing of the facilities at Pontiac. After studying the matter at length, however, the legislature decided to support the school, but with the proviso that it be located "as determined by the State Board of Education at an existing campus of a state university with an existing school of medicine." Again the legislators were chary of duplicating facilities.

Negotiations with the three state medical schools led to MSU being designated as the site. The MSU trustees accepted the decision on the assurance of "adequate funding" and on 1 July 1970 appointed the Pontiac school's incumbent dean, Myron S. Megan, to be dean of the College of Osteopathic Medicine at MSU. It was decided that the two classes enrolled at Pontiac would complete their courses there, but that subsequent classes would study on the MSU campus.

If it was something of a shotgun wedding with the legislature holding the shotgun, the union, in many ways, appears to be working surprisingly well with the principals managing something substantially more than peaceful coexistence.

At MSU, the legislature has wielded considerable influence in medical education through astute control of building funds. Now the legislators are moving to impose a new system of reporting for medical schools, which is designed to increase accountability and is likely to bolster that influence over medical schools. For medical schools in Michigan all of this raises a number of questions usually found under the rubric of academic freedom or university autonomy. These questions will be discussed in another article as will the novel operations of two medical schools on the MSU campus.—JOHN WALSH

APPOINTMENTS

D. Whitney Halladay, president, East Texas State University, to president, Texas A & I University, Corpus Christi. . . . **Matina S. Horner**, assistant professor of clinical and personality psychology, Harvard University, to president, Radcliffe College. . . . **James C. Finlay**, dean, Graduate School of Arts and Sciences, Fordham University, to president of the university. . . . **Curtis P. Ramsey**, chairman, elementary education department, Kent State University, to dean, College of Education, University of Bridgeport. . . . **Brandt Kehoe**, associate professor of physics, University of Maryland, to dean, School of Natural Sciences, Fresno State College. . . . **David L. Wheeler**, associate dean, Graduate School, Illinois State University, to dean, Graduate School, West Texas State University. . . . **James V. Clark**, staff member, Federal Execu-

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