The Pahlavi Problem: A Superficial Diagnosis Brought the Shah into the United States

Mexican doctors could probably have handled his illnesses just as well

New York—When President Carter made his decision to admit the ailing Shah of Iran, he weighed the known risk that American diplomats might be taken hostage in Teheran against the humanitarian benefit of saving a life with American medical expertise. But in making that judgment he acted on medical advice that was both flawed and incomplete.

Some of the details of the Shah's illness have been reported, but only by looking at the fuller picture, and the step by step development of the diagnosis of his condition, do the actions of the principals become clearer, and even now there is much that remains unexplained.

No one denies that the Shah was a sick man and remains so. But Benjamin H. Kean, the American doctor who attended the Shah in Mexico, misread both the nature of the Shah's illness and the capacity of Mexican doctors to deal with it. Nothing done by the doctors at New York Hospital or at the Memorial Sloan-Kettering Cancer Center was any trickier than what doctors in Mexico do routinely. There may have been good reasons for admitting the Shah to the United States, but there were not compelling reasons.

As for the nature of the campaign to get the Shah in, it is no secret that David Rockefeller, chairman of the Chase Manhattan Bank, had been lobbying to have the Shah admitted permanently long before his illness became known. It was Rockefeller, a friend and longtime business associate of the Shah, who sent a doctor to examine the Shah in Mexico. Kean went to Mexico twice over $3\frac{1}{2}$ weeks, but still the Shah was admitted to the United States on an urgent, life-threatening basis. Kean's examination of the Shah was bound to be less than definitive, since a full array of diagnostic tests was not done. Even so, there is no evidence to indicate that his misreading of the Shah's condition was other than a genuine oversight, or that the Shah's condition was deliberately misrepresented to the State Department.

What subsequently muddied the waters, however, was the confusing and selective public information policy adopted by the Shah and the New York Hospital. Spokesmen for the hospital left the impression that the Shah's illness was more serious than was in fact the case.

The story of the Shah's admission to the United States began when the Shah asked Rockefeller for American medical help after doctors in Mexico couldn't cure him of what they diagnosed as malaria.

Rockefeller and Kean, chief of tropical medicine at New York Hospital, are friends, and Kean seemed the right man to send for malaria. But as soon as Kean arrived in Cuernavaca, he realized it wasn't malaria. Something, he figured, was blocking the bile duct, causing abdominal pain, weight loss, and nausea. Then the Shah revealed the closely guarded secret that he had been treated for 6 years for a mild form of lymph cancer. Kean began to suspect that a tumor might be causing the bile duct blockage.

By mid-October, a month later, Kean had determined that there was an urgent need to get the Shah to New York Hospital; the medical facilities in Mexico weren't adequate to the task. It was that simple, Rockefeller asserted to a meeting of senior officers of the Chase Manhattan Bank, according to one of those present.

> The acute condition causing the abdominal trouble wasn't a malignancy needing state-of-the-art therapy. . . . It was gallstones.

But Kean's recommendation raises a number of questions, which Kean himself is not yet prepared to answer. Among them:

- Why didn't Kean, a pathologist primarily known for his research into Mexican *turista*, call in American experts in biliary disease and lymphoma to examine the Shah? Why weren't top Mexican oncologists consulted?
- Why didn't Kean take the Shah into Mexico City, less than an hour's drive from Cuernavaca, for diagnostic tests?
- Why did the Shah's spokesman say that sophisticated diagnostic equipment such as CAT (computerized axial tomography) scanners and therapeutic devices such as linear accelerators aren't available in Mexico City—when they are?
- Why didn't the State Department *insist* that the Shah be diagnosed in Mexico City to find out whether special American medical knowledge was needed?
- Why didn't someone suggest to the President that he insist on all this before admitting the Shah?
- Why did the State Department and the White House stake the decision on the medical judgment of a doctor sent to Mexico by the nation's leading advocate of letting the Shah into the country whether healthy or not.

If there were compelling reasons to have allowed the Shah into the United States for medical care, other than the Shah's desire to have doctors of his own choice, they haven't emerged. Not only Kean, but also the State Department, the White House, and Rockefeller refuse to provide details on what happened during the month between Kean's original trip to Mexico and the Shah's eventual arrival at New York Hospital.

Doctors who have talked to colleagues involved with the case say that Kean, who visited Mexico annually for many years as part of his well-known *turista* research projects, felt strongly that the Shah's case was complicated and needed the wide-ranging resources of an American medical complex such as his own New York Hospital–Cornell Medical Center.

What became clear within 24 hours at

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New York Hospital was that Kean's presumptive diagnosis had been wrong. The acute condition causing the abdominal trouble wasn't a malignancy needing state-of-the-art therapy (which would have been available in Mexico anyway). It was gallstones, hardly requiring American skills.

By then, however, the State Department had spread the word that the Shah was suffering from a mild lymphoma. The information about the lymphoma, which Kean passed on to the State Department, seems to have swept the President into his decision to admit the Shah; "cancer" has an ominous and urgent tone. And here, in a way, the State Department got off the hook. In a medical development completely unrelated to the Shah's abdominal problems, a total coincidence, the Shah's mild lymphoma was found in New York to have transformed itself into a considerably more serious form of the disease.

What isn't clear, however, is why it took the State Department so long to find out about the 6-year history of mild lymphoma. It was on Kean's first trip to Mexico, around 20 September, that the Shah informed him about the lymphoma.

The State Department says that it heard through "intermediaries" in "early October" that the Shah was sick. It was in mid-October, says a State Department spokesman, that "we had the specifics of his illness." Sources say that it was on 16 October that senior Rockefeller aide Joseph Reed called David D. Newsom, undersecretary of state for political affairs, and told him of Kean's judgment that the Shah was a sick man with cancer and urgently needed sophisticated diagnostic facilities and therapeutic facilities in New York.

When he returned to New York in late September after the first trip, Kean told friends how reluctant the Shah had been to reveal that he was suffering from lymphoma. Before his second trip to Mexico, the tropical disease expert began calling lymphoma experts around the United States to find out the likelihood that lymphoma was causing the biliary problem. He was told it was possible but unlikely; if it was malignancy, it was more likely pancreatic cancer.

Meanwhile, between trips to Mexico, Kean told Rockefeller that he hoped the Shah would get better. At that time, through the Reed-to-Newsom channel, Rockefeller passed the word to his friend, Secretary of State Cyrus Vance, that the Shah was ill. It was the first intimation to Vance, formerly chairman of the Rockefeller Foundation, that Rockefeller might push for the Shah's admission to the United States for medical rather than political reasons.

Around 15 October, Kean went back to Cuernavaca. The Shah was getting worse fast. Consideration was given to admitting him to the Oncology Hospital of the Social Security Medical Center in Mexico City. But the idea was rejected.

"Kean made a presumption that this was going to be a complex situation," said one doctor privy to details, "that they would need more facilities than they would be comfortable with in Mexico. And, at the same time, the patient was not prepared to enter into a new relationship with a new group of doctors in a facility in which he didn't feel comfortable. The Shah was also advised that compared with New York Hospital, the facilities weren't adequate."

Apparently Dr. Eben H. Dustin, the deputy assistant secretary of state for medical services, a general practitioner, suggested then that a second opinion be obtained. When Rockefeller got this news, he personally called Vance to intercede.

Medical sources say that the Shah had lost confidence in Mexican doctors and wanted to be treated at Kean's hospital. He is said to have refused flatly to be treated in a Mexican hospital. He may have been influenced by the fact that a team of New York Hospital surgeons flew to Teheran 28 years ago to remove the Shah's appendix.

When the Shah was still in New York Hospital, his doctors kept promising to explain all the seeming inconsistencies surrounding Kean's Mexican mission and the Shah's treatment just as soon as the Shah was out of the hospital; with him still there it was all too sensitive. "What's the big urgency," said Dr. Melville Platt, deputy director of the hospital, a couple of days before the Shah left. "Wait just a little while longer, and we'll get it all out in the open." But once the Shah left, the hospital said it couldn't talk about a former patient.

Kean has stoutly resisted pressure to tell his story. He takes the position that he isn't being muzzled but that he can't talk. "If and when I talk," he said, "it will be when the patient thinks it's to the national interest. If the Shah thinks an illumination of the details of his illness would be proper, I'd be prepared to provide it. I understand that there are unexplained or unilluminated facets to the whole situation, and it must arouse curiosity. One can make a very good case that it would be to the national interest if all this were cleared up, but I don't think I'm the one who should make that decision."

The State Department insists it went ahead and consulted its own, independent expert . . . but it refuses to say who it was or how the expert reached a conclusion.

The State Department insists it went ahead and consulted its own, independent expert for a second opinion, but it refuses to say who it was or how the expert reached a conclusion. There has been no indication that any other American doctor besides Kean examined the Shah in Mexico. And whatever was done, it was done quickly. Reed called Newsom on 16 October, and 3 days later senior New York Hospital officials were alerted that the Shah would probably be there soon. On 22 October, he was.

Whomever it consulted, the State Department didn't turn to the National Cancer Institute. Both Drs. Arthur C. Upton, then director of the NCI, and Vincent T. DeVita, Jr., director of the division of cancer treatment and known for his lymphoma work, say they heard nothing. Dr. Frank J. Rauscher, vice president of the American Cancer Society for scientific affairs and the former NCI director, wasn't called.

Kean says he had one brief conversation with Dustin before the Shah entered the country. Since then, though, Kean briefed the State Department and the White House frequently.

The top administrators at New York Hospital are Dr. David D. Thompson, the hospital director, and Stanley de J. Osborne, the chairman of the board of governors. Osborne is a partner in the investment banking house of Lazard Freres of One Rockefeller Plaza, a firm close to the Rockefeller interests.

Osborne insists that doctor-patient confidentiality is the reason for the hospital's persistent silence on unexplained questions about the Shah's illness—not some alleged Rockefeller inspired conspiracy to use medical reasons to admit the Shah when political persuasion failed.

As for Thompson, he has differed with

journalists before on the issue of the public's right to know. Four years ago, reporters demanded to know how identical-twin fertility experts, Drs. Stewart and Cyril Marcus, attending physicians at New York Hospital, came to die together of acute barbiturate withdrawal. Journalists insisted that, in view of reports of covered-up incidents in the operating room and elsewhere involving the obstetricians-gynecologists, there was a legitimate need for the public to know whether New York Hospital was protecting their interest by controlling impaired physicians. Thompson's response was similar to his current stance. He invoked the canon of confidentiality. But in that case he only stonewalled for 5 weeks. Then, under great pressure, he issued a full, detailed statement—confidentiality notwithstanding.

Two days after the Shah departed for Texas, Osborne and Thompson issued a statement saying that the Shah had instructed them to say no more, and the hospital was bound by doctor-patient confidentiality. But they disassociated the hospital from Kean's trips to Mexico, saying he had made the distant house calls on his own, and he was still on his own if he wanted to talk.

Privately, doctors at the hospital, both those involved in the case and otherwise, were disturbed at what they believe to be physicians letting the time-honored tradition of doctor-patient confidentiality become perverted for political purposes. None would go so far as to advocate that New York Hospital violate confidentiality, but most felt the hospital allowed itself to be used by the Shah—for whatever purposes the Shah may have had. There was a strong feeling that the hospital and the State Department, in view of the sensitivity of the Shah's admission to the country, should have made the Shah's agreement to full medical disclosure a precondition.

Confidentiality is between doctor and patient, and it belongs to the patient. The patient may violate it, not the doctor. The patient may order the doctor to say he has the grippe when, in fact, it is the mumps. A doctor may refuse to lie overtly, but he is duty-bound to keep silent about the truth if the patient insists. However, in the case of the Shah, doctors at New York Hospital were told to tell some of the truth some of the time to some of the people.

At one point, New York Hospital doctors reported their finding that the Shah was suffering from an advanced form of diffuse histiocytic lymphoma. But then, when they realized the lymphoma wasn't

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Diesel Makers Win Waiver from EPA

The dieselization of the American automobile came a step closer to reality in December as the result of a decision made by the Environmental Protection Agency (EPA).

General Motors and two foreign manufacturers won partial waivers of clean air rules from the EPA, allowing them to install slightly substandard diesel engines in 1981 and 1982 model cars. As anticipated, the EPA justified the small tactical concession on the grounds that it would strengthen its long-term strategy for diesels and demonstrate that the government has not taken an inflexible attitude (*Science*, 21 December 1979).

The issue arose because the Clean Air Act requires that 1981 autos emit no more than 1 gram of nitrogen oxide pollutants (NO_x) per vehicle mile (gpm). This improvement over the 1980 standard of 2 grams per mile will be difficult to achieve, particularly for diesels. For this reason, the law allows the administrator of EPA to grant waivers of up to 4 years from the NO_x standard for diesel engines emitting no more than 1.5 gpm. Five manufacturers asked for waivers on nearly a score of engines. Three (GM, Daimler-Benz, and Volvo) won waivers, but only for four engines and only for 2 years.

EPA Administrator Douglas Costle explained himself as follows: "My decision to waive the NO_x standard for diesels in 1981-1982 represents a balancing of risks between a more gradual decline in NO_x emission reductions if I grant the waivers, and the possible increase in particulate emissions if I deny." EPA officials said that this meant the agency is more concerned about particulate pollution than NO_x, and is mustering its heavy guns for a later battle. The technology now in use to control NO_x actually increases particulate emissions when applied to diesel engines. Particulate pollution is considered a serious threat to public health, and tests of carcinogenicity are now in progress. The EPA did not want to take any action that might later compromise its hard line on particulates.

There are methods for reducing NO_x and particulate emissions simultaneously, but they have not been developed into marketable technologies. By giving the car manufacturers an additional 2 years to refine these techniques, the EPA will be in a stronger position to argue in 1983—when strict particulate limits are scheduled to go into effect—that it has dealt fairly with the industry.

The auto companies are eager to produce diesels because they are more efficient than gasoline engines of similar power. Thus they will make it easier for the companies to meet the government's mileage standards without major changes in auto design. Many of today's gas guzzlers are about to become diesel guzzlers. GM says that the engine for which it received a waiver is a V-8 model, developed for use in Cadillacs, Oldsmobiles, big Chevrolet station wagons, and other heavy cars.

Robert Rauch, an attorney for the Environmental Defense Fund who lobbied against the grant of waivers, said he was unhappy with the decision but did not plan to file a lawsuit challenging it. He thought the agency had abandoned a point of principle in granting an exemption for diesel production before the question of safety has been settled. The auto makers, he said, "essentially got what they wanted—a foot in the door for wholesale dieselization."

A Clinical Trial for Laetrile This Spring?

Laetrile, the ever popular but unproved cancer medicine, will be given a full clinical trial this year by the National Cancer Institute (NCI), provided it passes a preliminary screening required by the Food and Drug Administration (FDA). Laetrile advocates have been pushing for such a test for years. The NCI agreed to conduct tests on humans in December 1978, pending FDA approval of the protocols. Now the final FDA clearance is in sight.

The cancer institute will test Laetrile as a new drug, even though all previous animal experiments had found it ineffective in treating tumors. According to Lorraine Kershner of the NCI, "We would not normally apply for [clinical trials] given that background,

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so advanced, they said nothing. Is that confidentiality or dissembling?

Meanwhile, senior officials at adjoining and affiliated Cornell University Medical College were understood to be upset at what they believe to be their institution's undeserved black eye from the actions of New York Hospital. But in the power structure of New York Hospital–Cornell Medical Center, New York Hospital calls the shots. Quiet efforts by Cornell officials to persuade the hospital to be more communicative led to nothing.

At the same time, only muffled murmurs emerged from Memorial Sloan-Kettering Cancer Center, which is just across the street from New York Hospital. All radiotherapy for New York Hospital patients is done at Memorial Hospital, and there—between 1 and 5 o'clock in the morning, for security reasons—the Shah received ten treatments for a lymphoma in his neck that had grown to about the size of a small apple. The last treatment was given at 3 a.m. on Thanksgiving Day. The therapy was given with a linear accelerator by Dr. Florence Chu, chief of radiotherapy at Memorial Hospital.

Doctors at Memorial Hospital said that the word there, reportedly issued by Laurance Rockefeller, chairman of the board of Memorial Sloan-Kettering Cancer Center, was to admit nothing—not even that there was a linear accelerator in the neighborhood. (In late 1978, the Shah donated $1 million to the Sloan-Kettering Institute after immunologist Robert Good, director of the institute, and another oncologist went to Teheran to attend the Shah's mother who was suffering from cancer. A center spokesman confirmed the donation, which has never been announced. He said there were no specific plans yet on how to use the money, which is in reserve.) Memorial Hospital never contradicted statements by the Shah's public relations man, a former David Rockefeller staffer named Robert Armao, that the Shah was receiving radiation therapy in New York of a kind available nowhere else.

Radiotherapists scoffed at this. Several radiotherapists, including Dr. Jose Noriega-Limon, director of the National Cancer Institute of Mexico, pointed out that for radiation to a superficial node in the neck, cobalt is perfectly adequate. And even if it weren't, said Noriega, there is a linear accelerator at the Oncology Hospital of the Social Security Medical Center in Mexico City, where another deposed leader, Hector Camporra of Argentina, was receiving treatment for cancer.

Efforts by the Shah's public relations man to say that CAT equipment was unavailable in Mexico City were also quickly dismissed. Dr. Noriega said he knew of two operating CAT scanners in Mexico City, and there are others as well (*Science*, 14 December). Moreover, said Noriega, there is a wealth of ultrasound diagnostic equipment in Mexico City, and radiologists there have long since mastered cholangiography for the diagnosis of gallstones.

Medical sources say that what has most upset the New York Hospital doctors who treated the Shah is that permission to comment on the Shah's condition was granted and withdrawn selectively. This, they say, led to the misconception about the Shah's lymphoma that has never been officially corrected. It could mean a difference of many months or even years to the anticipated lifetime of the Shah.

When the Shah arrived at New York Hospital, Kean expected that CAT and ultrasound diagnostic tests would probably reveal pancreatic cancer which, at the symptomatic stage, is nearly always rapidly fatal. His second thought was that the Shah's lymphoma had spread to the liver and was blocking his bile duct.

Permission to comment on the Shah's condition was granted and withdrawn selectively.

The gallbladder problem became clear rapidly and so did the transformation of the lymphoma. Biopsies showed it had transformed into an aggressive form called diffuse histiocytic lymphoma—which is rapidly fatal if not treated quickly and well. It's often fatal anyway.

At their lone press conference, the doctors described the disease as "stage III, maybe IV," saying that the disease had spread from the neck to the spleen. This spread is what characterizes the staging. If the lymphoma had been localized in the neck it would have been stage I, maybe II. But dissemination below the neck made it stage III automatically, maybe IV. According to sources, however, the staging immediately came into dispute. Abdominal nodes and the liver had looked normal during gallbladder surgery, and there was a suggestion that the Shah had a chronically enlarged spleen.

Treatment for stage III or IV diffuse histiocytic lymphoma is aggressive chemotherapy with several different highly toxic drugs in combination. But first there was concern that one of the key drugs, vincristine, which must be cleared by a well-functioning liver, might kill the Shah if he developed cholangitis—as he did at one point (a drainage tube with infection potential had to be left in the Shah for 5 weeks as part of the nonsurgical technique to remove the gallstone that was left in the intrahepatic portion of his bile duct). Also, liver-function tests showed there had been some damage from the gallbladder disease. Second, there was concern that another of the key drugs, doxorubicin, which has serious cardiac toxicity for some patients, could be dangerous for a man with a mild heart condition—another of the Shah's problems which hasn't been publicly revealed. At the same time, bone marrow tests, though they didn't reveal lymphoma in the marrow, suggested that the Shah didn't have enough marrow reserve to be able to withstand aggressive chemotherapy.

But just as doctors were about to make some tough decisions on chemotherapy, they revised their opinion of the stage of the Shah's lymphoma. And that meant a very different treatment became the one of choice—radiotherapy. The Shah was handed over to radiotherapist Chu and her linear accelerator.

None of this was explained publicly. One day the Shah had "stage III, maybe IV" diffuse histiocytic lymphoma and chemotherapy was needed, the next day he couldn't have chemotherapy because of his gallbladder problem, and from then on chemotherapy was never again officially mentioned.

Two days before the Shah flew off from San Antonio's Lackland Air Force Base to Panama, Kean filed an affidavit with a court that was demanding the Shah's presence in a civil suit. Kean said the Shah's condition had apparently deteriorated in the past few days and he planned to go to San Antonio the next day to discuss possible surgery. As a result, it would be medically hazardous for the Shah to give a videotaped deposition in the case. But there was no surgery, and the Shah was well enough to fly off

to Panama where he had a short press conference.

Medical sources say that Kean and Dr. Hibbard Williams, who is physician in chief at New York Hospital, went to San Antonio merely to give the Shah a last check before he went to Panama. No one could figure out what kind of surgery Kean meant, and Kean won't elaborate.

On the last day of the Shah's stay in San Antonio, the news was leaked that chemotherapy had been started—finally. It had, but what wasn't made clear was that the drug was chlorambucil, which is the same maintenance drug, a derivative of nitrogen mustard, the Shah had been taking every day for 6 years for the milder form of lymphoma. It was not aggressive chemotherapy for diffuse histiocytic disease. Just as the textbooks advise, he started taking chlorambucil again 4 weeks after a course of radiotherapy.

Had the Shah's doctors decided that his lymphoma had reverted to the milder form, and was he rid of diffuse histiocytic lymphoma? So it would seem, but the doctors haven't said.—MARK BLOOM

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For the 1980's, Beware All Expert Predictions

The experts promised us programmed dreams and picturephones in the 1970's, and continued subjection of women

Knowing what not to expect in the 1980's is easy—just listen to what the pundits are predicting, and bear in mind what they forecast for the 1970's.

Zbigniew Brzezinski, for instance, promised in *Between Two Ages* (1970) that we would be living in something called the "technetronic era," but if we are, no one seems aware of the fact. Alvin Toffler in *Future Shock* (1970) warned of society's psychic problems in keeping up with an accelerating rate of technological change. Unfortunately in 1980 it is the deceleration in national innovativeness that is the subject of widespread concern.

The brothers William and Paul Paddock published in 1967 a book with the unequivocal title of *Famine—1975!* "The timetable of food shortages will vary from nation to nation, but by 1975 sufficiently serious food crises will have broken out . . . so the problem will be in full view. The Time of Famines will have begun," the Paddocks predicted in their clear and forceful prose.

India, they supposed, would be the first country to go under: "By 1974 India will have increased her population by 120 million. India cannot, literally cannot, feed that many more mouths." India is at present self-sufficient in food production.

Population growth in the 1970's was not so bad as the demographers expected: estimates for world population in the year 2000 have fallen from 6.5 billion in the early 1970's to under 6 billion as of present. The green revolution, all the criticisms notwithstanding, was one factor that helped world grain production increase at an average of 3.1 percent a year during the 1970's, well ahead of the average increase in population.

The Paddocks were undeterred by the world's failure to keep to their timetable. In 1976 they reissued their lively jeremiad with not a word changed, except for the title; the book is now called *Time of Famines*.

Every fortune teller knows the shortsightedness of hamstringing good predictions with overprecise dates. United Nations Secretary-General U Thant neglected this rule in a forecast of 1969, reprinted as the introduction to *Limits to Growth*:

> I do not wish to seem overdramatic but I can only conclude from the information that is available to me as Secretary-General, that the Members of the United Nations have perhaps ten years left in which to subordinate their ancient quarrels and launch a global partnership to curb the arms race, to improve the human environment, to defuse the population explosion, and to supply the required momentum to development efforts. If such a global partnership is not formed within the next decade, then I very much fear that the problems I have mentioned will have reached such staggering proportions that they will be beyond our capacity to control.

While Malthusians purveyed scenarios as cheerful as Ezekiel's vision, the dreadful army of Panglossians, with Herman Kahn at their head, offered a technological paradise. The world in 2176, predicted Kahn in 1975, would have a population of 15 billion and a per capita income of $20,000. Kahn himself may not be around at that date when people come asking for their money, but he gave some nearer term hostages to fortune in an essay of 1965.* Together with Anthony J. Wiener he listed 100 subject areas "in which technological innovation will almost certainly occur" by the year 2000. With a third of the period of prediction already elapsed, there is not much sign yet of "widespread use of nuclear reactors," "use of nuclear explosives for excavation and mining," "some control of weather or climate," "human hibernation for relatively extensive periods," "permanent manned satellites and lunar installations," "chemical methods for improved memory and learning," "new biological and chemical methods to identify, trace, incapacitate or annoy people for police and military uses," or "artificial moons and other methods of lighting large areas at night."

And where, Herman, are the "programmed dreams" and "individual flying platforms" you promised us?

The Nixon White House fell under the spell of the Kahn-do philosophy. To lift the nation's sights, its National Goals Research Staff published a report in 1970, complete with an eloquent introduction by Daniel P. Moynihan, which offered examples of the technological marvels "which many experts now believe will be emerging in the 1970's." From the vantage point of 1980, a certain pleasure can be taken from such of the many experts' predictions as:

"Picturephones, already in limited use, may become widely disseminated."

"An increasing number of experts feel that some capability for modifying weather could become feasible during the decade."

"Some experts believe that during the 1970's a number of new capabilities for the influence of learning processes and improving memory . . . will be successfully demonstrated."

"As research on human reproduction continues, new forms of fertility control . . . could substitute a 'shot per year' for a 'pill per day.' "

*"Toward the year 2000: work in progress," *Daedalus* (summer 1967).

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