Health Care as a Human Right: A Cuban Perspective

Havana, Cuba. The Committees for the Defense of the Revolution were established here in 1960 to ferret out counterrevolutionaries before they could throw bombs at Fidel Castro and his comrades. They have proved highly effective. Today there are few signs of counterrevolutionaries—but there is a "defense" committee on virtually every city block. They mount patrols to guard against crime at night; verify that individuals who try to move goods, such as furniture, in fact own that furniture; and keep a sharp eye on neighborhood "troublemakers." One committee president told me he had arranged for the police to drag three men off to detention camps for the duration of an international youth festival this summer. Their offense: they often get drunk or make lewd comments to women. This is not a land that prizes civil liberties.

But over the years the committees have expanded their functions beyond mere surveillance; the block-by-block network is an extraordinarily useful vehicle for performing a variety of social tasks. The committees see that the streets are kept clean, collect bottles and papers for recycling, check that children are being sent to school, look after the needs of the elderly, help recruit boys into the army, and conduct regular political education meetings. More than 5 million Cubans are said to be enrolled in the committees. As one observer noted, almost all able-bodied Cuban adults are watching, helping, or admonishing their neighbors.

The committees play a key role in public health programs. The health director of one committee, an elderly woman, told me she checks regularly to see that pregnant women on her block get to the hospital in time, that sick neighbors receive medical treatment, and that women are tested regularly for cervical cancer. She also organizes volunteers to work in hospitals, and helps arrange blood donations. People with rare blood types are required to sleep in the blood banks during periods of crisis. The health director chuckled that one rare-blooded man on her block "goes mad every time a hurricane warning comes."

Mass immunizations are the crowning health achievement of the Cuban committees. At the time of my visit, the health director was preparing to immunize against polio all neighborhood children below the age of four . She was going to pick up candies saturated with oral polio vaccine from a zone committee the next day, give them to babies herself, and report back her accomplishments. In the early days of the Cuban Revolution, wild rumors circulated that the candies were drugs to convert all Cuban children to communism; it was sometimes hard to get mothers to cooperate. But today there is only an occasional recalcitrant, and she is quickly brought to heel when health authorities, backed by the law, are called in to compel immunization.

The immunization system is highly efficient. In the United States in 1976, health officials estimated that it would take several months to vaccinate the population with swine flu vaccine. By contrast, Cuba once vaccinated virtually all its young people against polio in a single day. "We eradicated polio before the United States—and you discovered the vaccine," boasts Mario Escalona Reguera, a professor at the Institute of Health Development here.

The Cuban health system is highly organized. Facilities are owned by the government and most personnel are paid government salaries; only a small remnant of private fee-for-service doctors survives from prerevolutionary days. Virtually all services are free to the patient, a practice which undoubtedly results in some frivolous use of medical services but keeps the customers happy. There are four main levels of care. The national institutes perform the most sophisticated operations, such as kidney transplants and open heart surgery (though some cases, such as patients with eye problems or rare endocrine diseases, are sent abroad). Provincial hospitals offer highly specialized care; regional and municipal hospitals provide the usual inpatient treatment; and area polyclinics offer ambulatory care. These government efforts are assisted by a number of mass citizen organizations—not just the defense committees, but groups enrolling women, workers, farmers, and students as well.

The Cuban approach differs in emphasis from our own. Instead of relying on the fancy gadgetry and sophisticated procedures of high-technology medicine, the Cubans concentrate on delivery of basic health services to the entire population. They emphasize prevention before cure, environmental as well as personal services, ambulatory treatment before hospital-based care, citizen participation in medical planning, and an equitable distribution of services to rich and poor, city dweller and rural resident. Some experts believe that the United States, with its own health problems among the poor, has much to learn from Cuba. Vicente Navarro, editor of the *International Journal of Health Services* and a leading analyst of Cuban medicine, praises Fidel Castro's government for "a remarkable job in terms of health services." The late Herbert L. Matthews, the leading journalistic interpreter of Cuba, concluded: "There is no country in Latin America that can show anything comparable."

The system has achieved spectacular advances in public health. Life expectancy is equal to that in the United States. Infant mortality plunged from 43.6 per 1000 live births in 1962 to 27.4 in 1975, one of the lowest rates in Latin America. (The U.S. rate stood at 16.1 in 1975.) Infectious and parasitic diseases have been brought under control or eliminated. Malaria was eradicated in 1968. Polio and diphtheria have been virtually wiped out. Typhoid and tetanus have been cut sharply. So have such waterborne diseases as dysentery and gastroenteritis. Today Cubans die from the same diseases that afflict most indusdustrialized nations—heart disease, cancer, and stroke, followed by influenza, pneumonia, and accidents. "We have a developed health system in a developing country," boasts Dora Galego Pimental, deputy director of international relations for the Ministry of Public Health.

The achievements should not be exaggerated. Cuba still faces major health problems. Venereal disease, which had been sharply reduced, is on the rise again. Virtually everyone has dental cavities. Smoking has proved impossible to eradicate—even Fidel has returned to his beloved cigars after ostentatiously quitting. Medical equipment is adequate but not abundant. And medicines are in short supply, largely because the United States embargo on trade with Cuba prohibits any but emergency sales and the Cubans have refused to dicker over what constitutes an emergency drug. The quality of care is also often shoddy. One disaffected doctor told me that a major

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hospital in Havana frequently neglects its patients. The doctor claimed one elderly woman was allowed to lie for days in a filthy condition, her bare feet caked with dirt, her hands and fingernails grimy. Similarly, a Massachusetts couple forced to rely on the services of a Cuban clinic were appalled at the filth and dismayed at the doctor's seeming lack of competence (see box). But measured against the standards of prerevolutionary Cuba or the rest of the developing world, the accomplishments of the Cuban Revolution are clear.

How did they do it? Partly by improving living conditions across the board. A literacy campaign has produced a population capable of responding to health care suggestions. New sewers and water lines have greatly improved sanitation. Housing, though still scarce, offers decent shelter. And a rationing system has resulted in better distribution of scarce foodstuffs, especially to the young, the elderly, and the ill. In prerevolutionary Cuba, malnutrition was widespread. By one count, 60 percent of the rural population, and one-third of the total population, was malnourished. But more recent studies found fewer cases of malnutrition—and those were seldom severe. Pediatricians even complained about the opposite problem—obesity among youngsters because of a high starch diet.

Cuba has also put substantial resources directly into health programs, far more than most Third World countries. The government takes enormous pride in its health services and is obviously willing to foot the bill. The 1978 budget allocates some 500 million pesos ($650 million) to public health—roughly two-thirds as much as the defense budget. A building boom has occurred. Old hospitals have been expanded, new hospitals built, and hundreds of clinics, dispensaries, laboratories, blood banks, and other medical institutions opened.

Health manpower has also received major investments. The revolutionary government was faced with a physician deficit of crisis proportions. In the 5 years after the Revolution, almost half of Cuba's doctors—3000 out of 6300—fled the country. Some opposed or feared the Revolution, others fled because their wealthy patients fled. Virtually all were from the upper and upper-middle classes that felt most threatened. The loss of talent was staggering—a brain hemorrhage rather than a brain drain—probably unprecedented in world history. But the revolutionary government recovered the lost ground rapidly. Medical education, like all education, was made free. New medical schools were built. And salaries for physicians were set high to attract recruits to the profession. A medical professor typically earns 750 pesos a month ($975), almost as much as a government minister. A specialist earns 630 pesos ($819), a general practitioner 550 pesos ($715). Those salaries may be low by U.S. standards, but they put physicians near the top of the earnings pyramid in Cuba.

The annual output of physicians quadrupled between 1964 and 1975. In the

Cuban System Not Without Flaws

An American woman spent 5 harrowing hours in a Cuban health clinic recently. The frightened patient was Mrs. Billie Rosoff, 53-year-old lay supervisor of the laparoscopy (sterilization) clinic at Pre-Term, a women's health clinic in the Boston area, who traveled to Cuba on a group tour early in February.

Mrs. Rosoff, who has a history of unusually severe sore throats, attended an outdoor entertainment near the Marazul Beach Hotel in Santa Maria. Within 5 minutes, she "developed glands the size of goose eggs." Anticipating that Cuba would be short of drugs, she had brought her own penicillin pills—which she took for 12 to 15 hours. "I felt awful. It was just agony. I had a fever," she recalls.

A Cuban guide, obviously proud of his country's health system, pressed her hard to go to the free clinic in Guanabo, some 5 miles away. A Cuban nurse at the hotel agreed. So Mrs. Rosoff reluctantly yielded—only to have the lurching cab ride to the clinic make her nauseous, thus compounding her discomfort.

The clinic was filthy, noisy, and cold, with paint peeling from the ceiling. "If I had a dog and this was the vet's place, I wouldn't take the dog back," said Arnold, Billie's husband. Some 40 or more adults stood around talking loudly; hordes of youngsters were screaming. "It was the noisiest place I've ever been in," says Mrs. Rosoff. "More like a community center than a clinic."

Mrs. Rosoff was put in a room with three other patients. "It was freezing," she said. "The louvers were wide open from floor to ceiling." "It was so cold and drafty," Arnold added, "that anyone with pneumonia would be dead."

Mrs. Rosoff entered at 3 p.m. and would not emerge until after 8 p.m.

The Rosoffs spoke no Spanish. The doctor little or no English. The tour-guide translated. The doctor examined her throat and stomach and took her temperature by placing the thermometer under her arm. He decided to give her an intravenous solution containing a drug to ease her nausea. The Rosoffs were leery but eventually yielded. "What was I going to do—stand there and argue with the man?" explains Mrs. Rosoff.

Then something went wrong. "I began to react as I knew I shouldn't," said Mrs. Rosoff. "I felt drugged. I couldn't keep my eyes open. It was like Kafka." Once she woke in a bed of sweat, unable to lift her head.

The Cuban doctor and nurses became nervous. They were unable to find Mrs. Rosoff's pulse or take her blood pressure. That's not unusual with Mrs. Rosoff—her veins are buried so deep that her own doctors have trouble finding them. But the Cubans apparently interpreted the lack of a pulse as evidence that she was in shock. They called an ambulance and wanted to ship Mrs. Rosoff to a hospital in Havana for additional tests. She tried to explain about her veins, but no one understood English. Finally, the Cubans understood and found her pulse. It was normal.

By this time the Rosoffs had had enough. They returned to the hotel, accompanied by an orderly from the clinic. Mrs. Rosoff fell into bed and decided to stay there a couple of days rather than risk going to the hospital in Havana. She threw out some pills prescribed by the Cuban doctor and treated herself with penicillin. Soon she was feeling better.

She concedes that the clinic may have helped relieve her nausea, which only existed because she had traveled to the clinic in the first place. But so far as she can tell, the clinic never did give her anything for her ailment—the sore throat.—P.M.B.

early days of the Revolution, when people were desperately needed to fill the medical ranks, the government lowered standards and cranked out graduates of dubious competence. But standards have since been raised to respectable levels. Today there are some 12,000 doctors in Cuba—about 1 for every 800 people. The comparable United States figure is 1 per 576 in 1976.

The Cubans now feel they have enough doctors to send many abroad to assist friendly regimes; more than 1000 are currently serving in Angola, Mozambique, Yemen, Jamaica, and other countries. And the expansion of the physician population is destined to continue. Already there are roughly 10,000 students studying to be doctors, almost as many as are now in practice; by 1985, there are expected to be 35,000 such students.

Some experts criticize this as a waste of precious resources in a small country whose economy is strained and could not survive without Soviet subsidies. It apparently reflects a desire by the revolutionary government to outdo the Batista regime it overthrew, and surpass the medical services provided by other nations as well. This is not a country that

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Current Congress Could Give Cabinet Berth to Education

President Carter's proposal to consolidate education programs in a new, Cabinet-level Department of Education had been moving at a glacial rate, and, glacierlike, melting a bit as the political climate heated up. Intense opposition to inclusion of several big programs caused them to be dropped from the plan. In recent weeks, however, both the pace and the general prospects of the effort have picked up.

The Administration in mid-April finally made known what it wanted included in a new department. And the Senate committee handling the matter will soon begin its mark-up of the required legislation and expects to send the measure to the floor by early July.

One major unresolved issue currently is disposition of the education directorate of the National Science Foundation. In Senate testimony, Office of Management and Budget director James T. McIntyre said that the Administration position was that a department of education "should directly involve science education programs designed to upgrade school and college curricula. However, we think that the graduate training and scholarship programs, which recruit and prepare scientists for the nation's scientific research efforts, should remain in NSF, as well as some smaller education programs directed at improving communications between the scientific and nonscientific communities."

Higher education organizations and the scientific community in general have opposed transfer of the education programs out of NSF. The main argument has been that science education activities can best be carried out in an agency devoted to the support and encouragement of science. Dividing the program is seen as cutting the baby in half.

The issue is under active consideration by the Senate Committee on Governmental Affairs, which has jurisdiction over the proposal for a department. But it is very possible that the matter may not be finally resolved until the House has acted and Senate and House meet to reconcile their versions of the measure.

The general attitude of the higher education lobby toward the creation of a department of education appears to have altered significantly. Initially, higher education organizations bridled at the prospect on the grounds that higher education would be submerged and neglected in a department in which elementary and secondary education interests would dominate because of the preponderance of federal programs in those areas. On reflection, higher education organizations decided that relatively few programs vital to higher education would be affected. Perhaps more reassuring, Administration spokesmen indicated that higher education would be given visibility and high bureaucratic status through creation of an "Assistant Secretary for Higher Education." The American Council on Education and other major higher education groups now appear to agree that they should put their efforts into seeing that higher education's interests are fairly represented in a new department.

The Administration commitment to a department of education dates from a Carter campaign pledge to establish one. Not until this year's State of the Union address however, was the idea given official impetus and only in mid-April did the Administration come through with details. The Senate Governmental Affairs Committee was a friendly congressional host to the idea since Senator Abraham Ribicoff (D–Conn.) has long been an advocate of departmental status for education; he was Secretary of Health, Education, and Welfare (HEW) under President Kennedy.

The bill which goes to the Senate floor is expected to be basically Ribicoff's, but will contain main features the Administration wants. The core of the proposed department would be the programs now in the Department of Health, Education, and Welfare and the National Institute of Education.

Major programs included out because of opposition of congressional patrons of politically strong constituencies are job-training programs now in the Labor Department, Veterans Administration education programs, and the Endowments for the Arts and Humanities, although the Administration wants to retain the option of considering the latter for inclusion later.

Prospects for the bill are viewed as brightening in part because of indications that the House Government Operations Committee will move promptly on the matter after the Senate completes action. The chairman of the House committee, Jack Brooks (D–Tex.), had been regarded as, at best, indifferent to the proposal and unlikely to take the initiative. Brooks has still not declared himself on the issue, but his committee is expected to follow good form and take it up this summer. Proponents say this makes it possible, if not probable, that a department could be sanctioned this year.

Eskimos Honor Whale Quota, but Ask New Terms for Hunt

Alaskan Eskimos seem to have reached a modus vivendi with the International Whaling Commission (IWC) and the U.S. government in the dispute over the Eskimos' right to hunt the bowhead whale in their ancestral fashion. The spring hunt of bowheads migrating north through the waters off the northwest coast of Alaska has virtually ended with Eskimos abiding by a compromise quota set at the end of last year.

A clash between the Eskimos and national and international authority was

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wants to rely on paramedics or "barefoot doctors." That may be good enough for China, I was told, but the Cubans intend to provide everyone with access to "real doctors."

This deluge of doctors has been accompanied by expansion of the entire health manpower pool. The annual output of dentists, for example, increased tenfold between 1958 and 1975, while output of technical aides jumped from a miniscule 32 in 1958 to more than 6000 in the mid-1970's. Thus the manpower base was both widened and deepened.

The manpower has also been better distributed. Cuba seems largely to have overcome a problem that plagues our own medical system—lack of services in rural and impoverished urban areas. Cuban medicine was respectable even before the Revolution, but like much else in prerevolutionary Cuba it was skewed to serve the urban well-to-do. Two-thirds of the doctors were jammed into Havana. In most rural areas there were few, if any, medical resources. The revolutionary movement, which drew its initial strength from the rural areas and then from the urban poor, has redressed the imbalance with a vengeance. A network

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generated when the IWC last June declared a moratorium suspending the exemption under which the Eskimos had been permitted to hunt the bowhead. The big Arctic whale is otherwise completely protected as an endangered species. The Eskimos argued that hunting the bowhead is necessary to their culture and subsistence diet (*Science*, 26 August 1977) and that the international body lacked power in the matter.

After an emergency IWC meeting last December, an ad hoc, 1-year quota was set allowing the Eskimo hunters 12 whales killed or 18 struck. In recent years, Eskimo whaling activity has increased considerably, particularly the number of whales struck but not landed. In the 1960's the average kill rate was under 20 a year; in 1977, 26 whales were reported landed, 2 killed and lost, and 77 struck and lost. Concern about this increase precipitated the moratorium.

The Eskimos have complained that the 1978 quota is too small to supply Eskimo needs and that, as a result, there will be food shortages in the whaling villages this year. They say they agreed to abide by the quota, however, as a demonstration of good faith and of a desire to see a new "management" system for the bowhead established in which the Eskimos would participate.

This year the Eskimos have apparently operated effective machinery of self-regulation with an Eskimo whaling commission setting quotas for each village. Only one village is reported to have exceeded its quota and, over all, the Eskimo hunters stayed within the quota total.

The Eskimos have also cooperated with the Commerce Department in an unprecedented effort to make a count of the migrating whales. The size of the total bowhead population has been in dispute, with Eskimos arguing that widely accepted estimates—of a total of 1000 to 2000 animals—were too low.

This year Commerce went all out to get a more accurate reading on the bowhead stock. The research budget on the whales was increased from $75,000 to $750,000, and a team numbering up to 50, with Eskimos on the payroll, was out on the ice making the count. Preliminary data are said to indicate that the bowhead population exceeds prevailing estimates, but officials caution that the data must be carefully analyzed before conclusions are drawn.

The Eskimos are asking that a special aboriginal whaling scheme be adopted with future quotas linked to biological limits which will permit both the continued recovery of the bowhead population and an adequate hunt for the Eskimos. Federal officials seem to be sympathetic to developing such a formula, but no firm policy stand has been adopted.

The bowhead issue is again on the agenda of IWC, which meets at the end of June in Cambridge, England, but the bowhead matter is likely to be overshadowed, since the IWC will be taking up the question of a 10-year moratorium on all pelagic whaling—that is commercial whaling on the high seas. A three-quarters majority of the 17 member nations is needed and a very close vote is expected.

U.S. Planning for UNCSTD—Problems of Development

Complaints continue that U.S. preparations for the United Nations Conference on Science and Technology for Development are getting back-burner treatment. Such feeling was reportedly conveyed in a recent letter to President Carter from House Science and Technology Committee chairman Olin E. Teague (D–Tex.). Teague, who has not received a reply to the letter sent in mid-May and has not yet made his letter public, is understood to have asked the President about the state of planning for the conference and urged that the matter be reviewed at the presidential level.

The conference, scheduled for August 1979 in Vienna, is expected to concentrate on technology transfer and other issues in the so-called "North-South dialogue" between industrial countries and less developed countries. American specialists in development matters have warned that a damaging confrontation could occur if U.S. policy positions are not well prepared (*Science*, 7 October 1977) and take into account the views of less developed countries.

The Administration had responded earlier by forming a separate office for UNCSTD headed by Ambassador Jean Wilkowski and appointing Notre Dame president Father Theodore Hesburgh to head the U.S. delegation to the meeting, but critics say the office has not been getting wholehearted support from the Executive.

Recently, critics have been protesting another cut, a literal one involving money. About $900,000 for the UNCSTD effort next year was included in a separate line item in the State Department authorization bill passed on 31 May by the House. But the line item has reportedly been deleted by the House Appropriation Committee and the money included in a general item for State Department salaries and expenses. Proponents of giving UNCSTD planning a priority see the action as a slight by State and the Office of Management and Budget in their not supporting the line item, as well as by the committee. They fear that the UNCSTD item will lose out in the departmental competition for funds. Money for a series of scheduled meetings in coming months to involve U.S. industry and nongovernmental organizations, among others, in the planning process are thought to be particularly vulnerable. In the Senate, an effort, led by Senator Adlai E. Stevenson (D–Ill.), is being made to restore the line item at a reduced level of $785,000. Even if the line item does not survive in the final funding measure, the effort could raise the consciousness of State's budgeteers about UNCSTD.

John Walsh

of rural hospitals has been created. Dental clinics have been scattered around the country. And doctors have been sent out to the front lines to serve all elements of the population.

The government has ended physician maldistribution largely by compulsion. Newly graduated doctors are required to serve 3 years wherever the government sends them—usually 2 years in a rural area and possibly the third at a regional hospital. Some elect to stay.

The government also uses carrot-and-stick incentives to persuade specialists and even medical school professors to practice community medicine on the front lines in neighborhood clinics. It is not just "barefoot doctors" who are disdained by the Cubans; they also reject the notion of "family physicians" to handle direct contact with people in the community. Instead, they prefer sending specialists—such as pediatricians, internists, obstetrician-gynecologists, and dentists—to practice their craft in the community. The goal, according to Cosme Ordonez, director of Havana's leading polyclinic, is to have specialists who are prepared to work at all levels of the health system—community clinics, hospitals, and centers for advanced treatment. And what if a specialist, say a professor at a medical school, declines to leave his prestigious post at a teaching hospital? Well, then, he doesn't have to. But he will hear mutterings about lack of revolutionary fervor, promotions may be slow in coming, and opportunities to buy scarce consumer goods, such as a car, will never arrive.

The key health facility increasingly is the polyclinic, which typically serves an an area of 25,000 to 30,000 persons. The staff includes doctors, dentists, nurses, sanitarians, social psychologists, public health specialists, and a variety of auxiliary and technical personnel. They see patients at the clinic and make forays into the community for home visits and inspections as well. The best clinics have become teaching institutions, analogous to a teaching hospital. In some, patients and residents have a voice in operations. Ordonez, for example, took corrective action at his clinic after receiving complaints from a citizens panel that areas were unclean, phone service was poor, turns at the x-ray machine were not awarded fairly, and employees were allowing their friends to jump all sorts of lines. But Ordonez refused to start clinic hours at 8 a.m. as requested because he needed the hour between 8 and 9 for medical lectures.

Judged by one yardstick—consumer satisfaction—the Cuban system rates high. My own haphazard survey elicited little but favorable comments. People tend to go to the doctor for the slightest ailment because service is free; few seem to mind the inevitable lines.

Psychological counseling was in surprising demand. I met one man who saw a psychiatrist weekly for 18 months to talk over problems resulting from a divorce. A 17-year-old boy saw a psychiatrist to recover from the termination of a love affair. And a homosexual university student went weekly for 3 months after the break-up of his affair. His "friendly and sweet" psychiatrist assured him he was "normal" and should live his own way without trying to change. Cuba seems far removed from those Communist states which use psychiatry as an instrument of political repression.

—PHILIP M. BOFFEY

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Cloning Caper Makes It to the Halls of Congress

In an interview in the June issue of *Penthouse*, David Rorvik, the author who has so cunningly put cloning on our minds, was asked how he would feel about a congressional investigation of his claim that a human being has been cloned and, now 18 months old, is living in California with Max, his millionaire parent-twin who loves him. "I'd welcome it," Rorvik answered. But when a chance to testify before a congressional subcommittee materialized late last month, he refused to take it. The hearing was held nevertheless.

On Wednesday, 31 May, acting against the advice of some of his staff and many members of the scientific community, Representative Paul G. Rogers (D–Fla.), chairman of the House subcommittee on health and the environment, held a hearing on "the area of science most properly termed 'cell biology,' " that really was an inquiry into Rorvik's book, *In His Image, The Cloning of a Man*. Although Rogers had summoned a stellar cast of scientists "to comment definitively on the state of the art with respect to the possibility of cloning a human being," it was clear that he regretted Rorvik's absence.

"It is unfortunate that the author of the book which began this controversy . . . is not with us today," Rogers said in a prepared opening statement. The subcommittee had been in touch with Rorvik ever since he emerged from seclusion when his book was published the day before April Fool's Day. At one point, he told Rogers' staff that he would appear on 21 April but canceled because of "personal health problems," and agreed to the 31 May date. But in midmonth, he wired Rogers that he could not come then either because he was extending a promotional tour in Europe. A subsequent telegram urging him to reconsider went unanswered. So, when the day came, there was Rogers, his hearing room filled with reporters and television cameramen, telling everyone how Rorvik had snubbed the subcommittee. In the very act of holding the hearing, Rogers gave Rorvik yet another round of free publicity, while laying himself open to speculation that, in view of his upcoming race for reelection, he may also have been motivated by the desire for a bit of publicity of his own.

On the other hand Rogers, who long has been a friend of science, did seem motivated by a desire to discredit Rorvik and to head off at the pass so-called public interest groups like the People's Business Commission that would like to see Congress at least consider setting limits to certain types of basic research. "I think it should be understood that cloning has a legitimate use, one which legitimate men and women of science are and have been employing in an effort to improve the general health and welfare of mankind," Rogers observed.

Testifying first were four scientists whose work in cell biology, including cloning and related techniques for studying cellular development, puts them at the top of their fields: Robert Briggs, Indiana University; Clement Markert, Yale University; Robert McKinnell, University of Minnesota; and Beatrice Mintz, Institute for Cancer Research,

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