The problem of change in our medical and health care system with particular emphasis on national health insurance is discussed. The need to see beyond the financial aspects to the structural changes required for the effective delivery of quality care is stressed.

THE IMPACT OF NATIONAL HEALTH INSURANCE ON DELIVERY OF HEALTH CARE

Mike Gorman, F.A.P.H.A.

In 1951, almost 100 years after Prince Von Bismarck introduced national health insurance in Prussia, I shepherded the members of the President's Commission on the Health Needs of the Nation here to San Francisco to hold several days of hearings on the crisis in the delivery of health services to the American people. The event was not an overwhelming success—although a few consumer voices were heard, the anvil chorus from the medical profession and its allies bellowed forth that we were blowing up an issue which could really be solved within its own ranks.

Coming back here two decades later, it is fairly obvious that the emergency which we contended existed in the 1950s is now the burning issue of the 1970s. President Nixon has warned the nation of "a massive crisis in health care." He said that "unless action is taken within the next two or three years, we will have a breakdown in our medical care system which could have consequences affecting millions of people throughout the country." The President is to be commended for his celebration of the obvious, but he slipped into the wrong tense—the breakdown has already occurred, and it is well upon us.

The Crisis Is Now

Who would have thought, even five years ago, that the National Governors' Conference, composed overwhelmingly of disciples of Mr. Nixon's party, would come out as it did in 1969 at its annual meeting calling upon the federal government to adopt a universal health insurance program primarily financed by employer-employee contributions under the Social Security System. Governor Nelson Rockefeller, who initiated the resolution, has again proposed that New York State lead the way with a system of prepaid health insurance.

The Health Insurance Association of America, long a stalwart rock against innovation, has also begun to jump the traces. In a press release from its New York office, the Association summarized the conclusions of a panel which included executives of Aetna, Prudential, Equitable Life Assurance, and other old line companies:

"The health care system today is in a condition of crisis, and one that is worsening. Panel members said the condition has been brought about by a conjunction of many forces, including shortages of manpower and facilities, rapidly rising costs, 21st century medical technology that is shackled to 19th century organizational patterns, and to the existence of a two-class system of health care which often results in inferior care, or no care, for the poor and the near poor in the inner cities and rural areas."

The American people today are spending more than 60 billion dollars for health care services, almost five times
more than we spent in 1950. As a percentage of the gross national product, health expenditures rose from 4.2 per cent in 1950 to 6.7 per cent in 1969. We are second only to the Department of Defense in our slice of the gross national product, and we are comparably afflicted by just as many cost plus overrides and inefficient delivery vehicles as that once sacrosanct department.

What are the American people getting for this fantastic level of expenditure? Private health insurance, hailed 35 years ago by its progenitors as the putative savior of the free enterprise medical care system in this country, is a disappointing failure openly acknowledged even by its own spokesmen. On the average, it meets only a little better than one-third of all consumer expenditures for health services; because of its fantastically high premiums, it excludes millions and millions of Americans who either have no insurance at all, or who have very limited coverage as ambulatory patients. The private health insurance industry and its allies in medicine still have an insatiable urge to immobilize all of its subscribers in a 24-hour bed; it is really almost beyond belief that, despite the supposed trend away from the costly hospital bed, between 1950 and 1967 the hospitals’ share of the medical care dollar rose from 35 per cent to 42 per cent of all expenditures.

The picture has not changed appreciably with the advent of Medicare and Medicaid. It is fairly well known that the insurance industry and the medical profession exacted, as the price the Johnson Administration paid for obtaining enactment of the legislation, a series of provisions precluding any cost or quality controls and essentially retaining the robber baron system under which the doctor charged whatever the traffic would bear.

Medicare and Medicaid are not health insurance devices; they cover, to a limited degree, manifest sickness on the old indemnity basis. These two programs now account for one dollar out of every five spent for medical services in this country. Total expenditures for the two programs in 1969 exceeded 13 billion dollars.

Medicare, which is the lesser evil of the two, covers only about 45 per cent of the health care costs of the patient because of the high deductibles, co-insurance factors, and fee piracies which characterize so many insurance mechanisms. However, Medicare is a paragon of statutory skill compared to Medicaid. Medicaid is poorhouse legislation of the worst kind. It has neither cost controls nor quality standards. Theoretically, it is supposed to cover the medically indigent of all ages who are not necessarily on welfare, but whose low incomes make it impossible for them to afford the soaring costs of medical care. In actual practice, it is only covering people on welfare in most states, and quite a few of these are doing it less adequately than the former categorical medical assistance programs.

Of the 45 million people at or below the poverty line in this country, only about 10 million are defined as eligible for Medicaid services after three years of operation. Senator Edward Kennedy, in a brilliant Lowell Lecture, put the problem in a nutshell when he remarked: “The most painful experience of Medicare and Medicaid has been their unfulfilled promises. We sought to speed the benefits of medical science and technology to millions of Americans without considering the anachronistic and obsolete structure of the system by which the health services would be delivered.”

Dr. John Knowles handled the issue a little less delicately but just as pungently as Senator Kennedy when he remarked that: “Medicaid is the lousiest waste of taxpayers’ money and the most ill-conceived program which ever came down the chute.”
An Aroused Citizenry

There is no possible way in which one can adequately portray the fierce discontent of the American people with regard to the delivery of basic medical services. In 1968 the Blue Cross Association, concerned with mounting public criticism of the inadequacies of health insurance, commissioned the pollster Lou Harris to do an in-depth sampling of the American people with the object of validating or refuting these contentions. The Harris survey was the most complete of its kind ever conducted, including home interviews with more than 1,000 people in all parts of the land. The results, as published in December of that year by the Blue Cross Association, can only be described as shocking.

Most of the respondents to the inquiry, whether poor or affluent, felt themselves isolated from good medical care. A majority reported that they would not know where to turn in the event of a serious illness in the family. From all of the accumulated evidence, the Harris survey concluded:

"Now, in the affluent 60's . . . it can truthfully be said that over one-third of this nation feels ill-cared for in its medical needs."

In the public sampling, more than half of the American people gave health a higher priority than having a good job and, among poverty groups, 72 per cent of poor whites and 59 per cent of poor blacks rated good health over a job or money.

Large segments of our population exhibit the deepest anxieties and frustrations when asked about the accessibility of good health care. Two-thirds of the general public feel that you cannot get a doctor in an emergency; 40 per cent of the general public, and two-thirds of the poor, worry that they will be unable to pay a doctor if they can locate one, and more than half of the general public, and two-thirds of the poor, told interviewers that they were terrified of a serious illness which would disable the breadwinner and wipe out all family savings.

This is no longer the passive kind of discontent that existed in the 1940s and the 1950s. The natives are restless and they are on the move. Such developments as the recent formation of the American Patients Association, and the picketing of municipal hospitals and health centers by both health professionals and aggrieved consumers, are surface indications of what is developing into a powerful mass revolution against our archaic medical care nonsystem.

In all of these manifestations of revolt, there is a persistent thrust to the effect that doctors can no longer dictate the mechanisms of delivery through which health is now provided to our people. For example, last year a report of the Health Task Force of the Urban Coalition called for the organization of consumers in all of our communities to negotiate and bargain with the health establishment for the quality of health care which they desire. This report, signed by some of America's most distinguished business, labor, and health leaders, urged the establishment of citizens' boards for health services which would negotiate with the providers of care in the initiation of a community-wide health service plan. Such a program has already been initiated by the Woodlawn Center in Chicago, and the idea is spreading to other parts of the country.

Champions of National Health Insurance

The most abrasive criticism of the doctor-knows-best syndrome has come within the past year or two from the pen of a man usually considered one of the pillars of the present health establishment—Walter McNerney, president of the Blue Cross Association. In a speech to the Group Health Institute last June, McNerney forthrightly proclaimed the
doctrine of consumer rights in these words:

"The fault lies within the field of health. It is here, primarily, that heavy emphasis has been placed on professional rather than consumer rights. The illusion that a non-competitive economy can become efficient largely through the good intentions of practitioners and institutions, given semi-monopoly power through licensure, is still being perpetuated."

The renewed interest in national health insurance has taken many divergent forms. In November, 1968, in the Bronfman Lecture to the American Public Health Association, the late Walter Reuther announced the formation of the Committee of One Hundred for National Health Insurance. In October, 1969, the committee held a three-day meeting to which it invited the officers and representatives of more than 65 national organizations, including the American Medical Association and the major non-profit and commercial carriers, to discuss the broad outlines of the kind of legislation needed to advance the move toward universal health insurance. Speaking as a member of the Executive Committee of the Committee for National Health Insurance, I make no claim that there was any unanimity of opinion on policy matters, but do want to emphasize that such a meeting of so many previously disparate factions was momentous in and of itself.

Since the 1968 announcement, a number of our more powerful organizations have decided that universal health insurance is eminently worth discussing. Dr. George Graham, a past president of the American Hospital Association, who was quoted a few months ago as saying that "we will have national health insurance in five years," has appointed a committee of his organization to study the problem. A few months ago, the Secretary of Health, Education, and Welfare asked a Task Force on Medicaid to broaden its assignment to include a study of alternative plans for national health insurance. Many professional organizations, such as the American Psychiatric Association, have appointed committees or commissions on the delivery of health services. The AFL-CIO, a rather passive supporter of national health insurance for many years, has now become quite activist in scheduling conferences and giving increasing attention to national health insurance in its publications.

However, some of us who have been committed to universal health insurance since the Truman days are acutely aware that the endorsement of the general concept does not necessarily mean a revolutionary break with the present non-system of delivery of medical care. Many of the plans being put forward as progressive answers to our current dilemma in reality propose nothing more than pouring additional billions of dollars of money through the sieve of the present antiquated and inefficient medical care system. As Senator Kennedy observed in the Lowell Lecture:

"Unwisely, as many experts have recognized, we assumed that all that stood between our poor and aged citizens and high quality medical care was a money ticket into the mainstream of modern American medicine."

The AMA proposals allowing tax credits for private health insurance premiums, with eligibility and the amount of credit based on the amount of tax liability, are perfect illustrations of Senator Kennedy's point. Not only would the gross costs of the AMA proposals be unbelievably high in terms of lost revenue—running anywhere from 10 to 16 billion dollars a year—but its tax credit plan would reinforce and sclerotocize the present wasteful private health insurance non-system. It is based upon the old indemnity for sickness principle; it would do nothing to improve the availability of health services, or to assure comprehensive health services of high quality at a reasonable cost.
Another plan recently put into legislative form by Senator Javits of New York would establish a national health insurance system largely patterned on Medicare and administered by the private insurance carriers. He is a sincere and dedicated public servant, but he is taking the wrong road to salvation. Allowing the private insurance carriers to administer the plan would be about as objective and fruitful as appointing Jesse Unruh to head a task force to evaluate the effectiveness of Governor Reagan. As Max Fine, the executive director of the Committee for National Health Insurance, recently put it: "The insurers are part of the problem, not part of the solution."

Costly Federal Chaos

For example, the federal government is by far the largest single purchaser of personal health services; it has funneled practically all of these purchases through the existing nonprofit and commercial carriers. The patterns it has thus set are largely responsible both for the continuing chaos in health delivery and the intolerable escalation of health care costs. The payment of so-called "reasonable and customary" physicians' fees—adapted from the commercial insurance industry and embedded in Medicare—as well as the reimbursement of hospitals on a cost-formula basis taken from Blue Cross, and the subsidy of industry profits in the roughly two-thirds of approved nursing home beds in this country which are privately owned—these are major causes of skyrocketing costs.

At the present time, massive sums of money are being spent on a bewildering set of public and voluntary programs. These are uncoordinated and, at best, provide only fragmented and inadequate treatment of episodic illness. Medicaid, Part A and B of Medicare, maternal and child health and crippled childrens' programs, and a helter-skelter of private health insurance programs underwritten by more than 1,200 health insurance carriers add up not only to confusion, but to payment of no more than one-third of personal health care expenditures in this country. Furthermore, the consumer is required to subsidize the heavy duplications in administrative costs, sales costs, reserve costs, and so on, that are built into a competitive, nonintegrated series of arrangements.

Private health insurance, previously far beyond the means of low-income groups, is increasingly beyond the fiscal capacity of families in the middle-income brackets. Milliman and Robertson, Inc., regarded by the insurance industry itself as one of the top consultants in the field, submitted a report last year to the U.S. Civil Service Commission on the federal employees' health insurance program which projected a family cost in excess of $1,000 annually by 1975. Who but buyers of Solid Gold Cadillacs will be able to afford it?

Goals for the Future

At a combined meeting of the Technical Task Force and the Executive Committee of the Committee for National Health Insurance held early in 1970, it was the unanimous conviction of those present—who had spent more than a year developing a legislative proposal—that its major thrust would be a total restructuring of the health delivery system which the Nixon Administration has characterized as a "cottage industry," and which Dr. Robert Ebert, dean of the Harvard Medical School, has called a "pushcart industry." It should be crystal clear that our major goal is not additional billions of dollars to be poured into the present leaky vehicle. One of the most distinguished health economists in the country recently completed a lengthy study of health costs...
for the Committee for National Health Insurance which documents irrefutably the point that we are wasting 14 billion dollars annually because of duplicating and inefficient delivery of health services. Our first priority is the establishment of a basic set of quality standards and cost controls which will enable us to deliver health insurance, not sickness insurance, to all of the American people.

We believe that national health insurance should encompass the entire range of services required or used for the maintenance of personal health. Put very simply, the goal is to assure the availability of comprehensive care—not to provide indemnification for costs incurred. As a consequence, national health insurance should provide for contract reimbursements to providers based upon freely negotiated capitation rates wherever possible. In addition, our national health insurance proposal will provide incentives for the development of a more desirable system of methods of payment which is without deductibles, barrier payments, co-insurance, indemnifications, and the like. Furthermore, sound national health insurance legislation should provide fiscal and other incentives toward the grouping, affiliation or integration of providers, moving away in the course of time from fractionated fee-for-service payments toward hospital-affiliated or hospital-based medical groups which would operate largely on a yearly capitation charge for subscribers.

All this will not happen overnight. If, as some of us believe, staging of benefits is unavoidable, priorities should be given to ambulatory over inpatient services and to primary preventive care, including comprehensive annual physical examinations.

Under our proposal, the providers of care will have a stake in keeping costs down. For example, under a capitation system a hospital-based group which delivers high quality medical care at a cost less than the national average will be allowed to "plow its proceeds" into expansion of facilities, postgraduate education, or whatever. As in the legendary Chinese system, the doctors will receive a bonus for keeping patients well and out of hospitals and, conversely, will be penalized for excessive hospitalizations or surgical interventions.

The national health insurance program should be financed by contributions from employers, employees, and self-employed persons, and from general tax revenues. Our tentative conclusion is that two-thirds of the fiscal resources of the program will come from payroll taxes under the Social Security Trust Fund procedures, and one-third will come from general tax revenues.

Space does not permit a detailed discussion of some of our plans for the use of a small percentage of the trust fund for the support of health manpower and for the construction and renovation of health facilities of all kinds. However, some of us believe that 5 per cent of the estimated total intake of 40 billion dollars—or roughly 2 billion dollars a year—should be devoted to manpower and health facilities. At the present time, the federal appropriation for both the construction and operation of hundreds of our schools in the health professions is less than 400 million dollars a year. Even more critical than the inadequate level of funding is the fact that the uncertainties in annual appropriations by the Congress really mean that no school or health facility can do any advance planning. The sorry history of the fiscal 1970 appropriations for the Department of Health, Education, and Welfare is a vivid reminder of the tenuous nature of the annual appropriations process. In building an entirely new health delivery system, we must put a firmer long-term base under our schools of health and our health facilities without which we cannot begin the
fundamental restructuring which is so necessary.

We do not contend that we can initiate national health insurance overnight, nor would we want to. As Senator Kennedy noted in the previously mentioned Lowell Lecture, it is unrealistic to suppose that a totally comprehensive program can be implemented all at once.

We of the Committee for National Health Insurance agree with Senator Kennedy that there should be a carefully planned and phased extension of coverage over a reasonable period of time, but our current thinking is that the present chaotic nonsystem can be altered more effectively by a gradual phase-in of additional benefits over a five-year period. However, we are open and flexible on these matters. We are in enthusiastic agreement with Senator Kennedy when he states that: "Half-way through the decade of the 70s, we should have a comprehensive national health insurance program in full operation for all Americans."

Administration Attitudes

What are some of the obstacles, alleged or real, to the achievement of this timetable? At the present time, the major obstacle seems to be the inconsistent position of health officials within the Nixon Administration. On the one hand, they go up and down the land castigating the present health delivery system but, on the other hand, they seem to resist all proposals for fundamental change. Discussing national health insurance at a press conference a few months ago, Dr. Roger Egeberg, the Assistant Secretary for Health, remarked that he did not think that we were ready for anything of that kind in this country. In a more recent interview, he contended that establishing national health insurance before there was enough manpower to meet existing commitments "would create chaos.” He further argued that the health system is close to breaking down now because of the ten million new patients already added by Medicare and Medicaid; therefore we must wait until this mess is cleaned up before moving on.

The alleged health manpower shortage is an old stick which has been used to belabor proposals for national health insurance since the introduction of the original Wagner Act more than three decades ago. In actual fact, we are wasting an enormous amount of the physician’s time because of the archaic nature of the present solo practitioner system. The Administration continues to use a rather questionable figure, promulgated by the Public Health Service more than 20 years ago, that you need one doctor for every 700 patients. A series of statistical evaluations in large group plans such as Kaiser-Permanente, the Health Insurance Plan of Greater New York, and others demonstrate that high quality medical care can be delivered with a ratio of one doctor for anywhere from 1,200 to 1,500 patients. Bert Seidman, director of the AFL-CIO Social Security Department, points out in a recent study that even if you assume that you need one physician per 1,000 patients, we would need only 200,000 physicians to cover our present population if the delivery of medical care was organized rationally. Since we now have approximately 230,000 physicians seeing patients, it seems quite clear that the fundamental issue is really one of rationalizing the system rather than adding thousands of doctors who will continue to practice in the old, inefficient way.

This point was made most tellingly by the National Advisory Commission on Health Manpower in its landmark report to President Johnson in 1968:

“If additional manpower are employed in the present manner and within the present patterns and ‘systems’ of medical care, they
will not avert, or perhaps even alleviate, the crisis. *Unless we improve the system* through which health care is provided, care will continue to become less satisfactory."

The Administration position is also extremely suspect when one compares its words with its actions. Despite all the outcries about the health manpower crisis, both the 1970 and 1971 budgets for health manpower are far below even the amounts authorized for these programs by the Congress in 1968.

Then there is another hoary contention that we do not have enough hospital beds in this country. Under the present nonsystem, this is quite true. Overhospitalization is obviously a critical issue—not a shortage of hospital beds. Again, the statistics are irrefutable. As you know, here in California the number of hospital days per 1,000 enrolled for both federal employees and employees of the state of California under group practice plans is approximately one-half that of their fellow employees enrolled under Blue Cross or commercial insurance plans.

**Funding and Costs**

What about the costs of a national health insurance program? Here again, factual analyses do not bear out the contention of our critics that such a plan would cost anywhere from 10 to 20 billion dollars more than we are presently spending for health services. For example, total expenditures for personal health services in this country amounted to approximately 41 billion dollars in 1968. Since the most comprehensive group practice plans cover about 80 per cent of personal health expenditures, we would have to generate approximately 33 billion dollars to finance the program. We are proposing a tripartite arrangement in which the federal government would contribute one-third of the cost out of general revenue, and the other two-thirds would come from a combination of employer-employee deductions under Social Security. As for the federal government, the 11 billion dollars is almost the identical amount that is now being spent in public expenditures at all levels for health care services. If we follow the proposal for national health insurance introduced earlier this year by Congresswoman Griffiths of Michigan, the employer would pay 3 per cent of payroll and the employee 1 per cent. Incidentally, the 1 per cent contribution from the worker would be less than he is now paying in the free market system where it is estimated that even when he is insured, he is still paying two-thirds of total health care costs out of his own pocket. From all of this data, the AFL-CIO has concluded that a national health insurance program could be financed without increasing taxes and with most workers paying less for health care than they do today.

Back in the days of the Truman Health Commission, we were told time and again by spokesmen for both organized medicine and the insurance industry that any national health insurance proposal would have to wait upon a vast expansion of health manpower, the building of additional hospitals and related facilities, and so on ad infinitum. Over the past two decades we have poured billions of dollars into more hospital beds and hundreds of millions into health manpower, but the mess gets worse every year.

In a very real sense, we have been using band-aids while the patient is hemorrhaging. There is a need for drastic surgery. In the Lowell Lecture, Senator Kennedy gave very short shrift to the delaying actions of our critics in the following pungent observation:

"... The organization and delivery of health care is so obviously inadequate to meet our current health crisis that only the catalyst of national health insurance will be able to produce the sort of basic revolution that is
needed if we are to escape the twin evils of
a national health disaster or the Federalization
of health care in the Seventies. To those who
say that national health insurance won't work
unless we first have an enormous increase in
health manpower and health facilities and a
revolution in the delivery of health care, I reply
that until we begin moving toward national
health insurance, neither Congress nor the
medical profession will ever take the basic
steps that are essential to reorganize the sys-
tem. Without national health insurance to
galvanize us into action, I fear that we will
simply continue to patch the present system
beyond any reasonable hope of survival."

I want to emphasize again that a
rational structure is more important
than money in redesigning our health
service system. A great California doc-
tor, Russel Lee, president of the Palo
Alto Clinic and a member of the orig-
inal Truman Health Commission, has
had an enormous impact on our think-
ing with his recent writings on health
care delivery. In a most thoughtful edi-
torial in Medical World News (1969),
Dr. Lee proposed the establishment of
neighborhood or community health cen-
ters staffed by group practice clinics
and based upon participating prepay-
ment plans. The center would be sup-
ported by a negotiated annual capitation
fee arrived at after bargaining with
labor unions, consumer cooperatives, or
whatever. In this sort of a set-up, both
the provider of care and the consumer
would have an identical incentive to
emphasize maintenance of health and
the consequent reduction of heavy hos-
pitalization and related costs.

This is, in essence, the philosophy of
the national health insurance bill intro-
duced by Congresswoman Griffiths. Un-
der her bill the federal government
would contract for health, hospital, and
dental services with organized groups
of physicians, with hospitals and with
groups of dentists. The contract would
cover comprehensive care for each indi-
vidual on a yearly capitation basis.
Where organized groups did not exist,
or where individual doctors desired to
continue on a fee-for-service basis, the
government would contract with state
and county medical societies for the
over-all coverage. The physician mem-
bers of the medical society would be
assuming group responsibility for pro-
viding services within the terms of the
capitation agreement, but the distribu-
tion of the money among members
would be determined by the medical
society. Under the Griffiths bill, where
the medical society chose to assume re-
 sponsibility for delivering medical serv-
ces, it would establish a system of peer
review and administrative procedures to
assure beneficiaries that the care they
received was of optimal quality. The
medical society would receive a 5 per-
cent bonus payment to cover adminis-
trative expenses for providing this im-
portant service. Furthermore, if the
medical society group plan achieved cost
savings below the amounts contracted
for, it would be allowed to retain these
savings and divide them up among the
practitioners in the plan.

The Griffiths bill has several obvious
virtues. First of all, in providing for a
contractual arrangement on a capitation
basis for yearly coverage of a person's
medical expenses, it bypasses the sticky
process of establishing fees for doctors
for various procedures. Secondly, it
answers our health manpower critics
who talk about the shortage of doctors
in our inner city and rural areas. Under
the bill, all hospitals and all health
professionals would be assured of ade-
quate remuneration, whether located in
a poverty area or in an affluent area.

Conclusion

We must face up to the problem of
national health insurance without any
of the perceptual biases, scare words,
and shibboleths which have cursed dis-
cussions of this problem in the past. The
distinguished New York surgeon, Dr.
George Himler—who headed a panel
that spent 17 months drafting 57 recommendations designed to change the American Medical Association's approach to the nation's health needs—told the Clinical Meeting in Denver last December that the AMA "must shape up or face obscurity."

As practitioners in a medical care system which has outlived its usefulness, may I cite this warning note from a very distinguished Californian and former Secretary of Health, Education, and Welfare, John Gardner:

"Let me remind you of an important thing to understand about any institution or social system, whether it is a nation or a city, a corporation or a federal agency: it doesn't move unless you give it a solid push. Not a mild push—a solid jolt. If the push is not administered by vigorous and purposeful leaders, it will be administered eventually by an aroused citizenry or by a crisis."

The crisis is at hand. The people are aroused and bitter about the mediocre level of medical care in this country today. Working together, citizen and professional, we can make the necessary changes and we can bring about a new and glorious day for American medicine.

Mr. Gorman is Executive Director, National Committee Against Mental Illness (1028 Connecticut Ave., N.W.), Washington, D. C. 20036.

This paper was presented before the Annual Scientific Assembly of the California Medical Association in San Francisco on March 9, 1970. It was submitted for publication in April, 1970.

Twentieth Century Refrigeration

"Refrigeration and Air Conditioning in the Service of Mankind" will be the theme of the Thirteenth International Conference on Refrigeration to be held in Washington, D. C., August 27 to September 3. Some 1,200 scientists and engineers from 30 countries are expected to attend the meeting organized by the National Academy of Sciences. Sessions will demonstrate the application of refrigeration techniques to such twentieth century situations as exploration of space, improvement of the environment, health, and preservation and distribution of food. (National Academy of Sciences, 2101 Constitution Ave., N.W., Washington, D. C. 20418.)