



Recollections of Professor Otto Meyerhof

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With Dr. Fischer's long interest in muscle physiology and with his background in Germany, I thought that my personal experiences in Professor Otto Meyerhof's laboratory in Heidelberg, 1931–1932, might be of interest.

This laboratory was at that time one of the outstanding centers for research in muscle physiology and chemistry. The laboratory was called the Kaiser Wilhelm-Institute für Medizinische Forschung. There were several such institutes for research in Germany established before World War I and they retained the name of the Kaiser for some time after this war. The Institute in Heidelberg was divided into four subdivisions; Biochemistry, Physiology, Pathology and Biophysics. The Institute of Biochemistry under Professor Kuhn and Physiology under Professor Meyerhof were very active, the other two were relatively quiet. The Institutes were housed in a modern well-equipped building situated close to the river. Professor Meyerhof's Institute was on two floors of one wing with animal quarters and shops in the basement. At the time when I was there, there were four full time members on the staff, Professor Otto Meyerhof, Professor Karl Lohmann, Dr. Herman Blaschko and Dr. H. Laser. Professor Lohmann was a well trained biochemist noted for his work on adenosinetriphosphate, who later went to Berlin. Dr. Blaschko is now a professor of Pharmacology at Oxford and a Fellow of the

Royal Society. Dr. Laser went to England where he continued his work in Dr. Keilin's laboratory in Cambridge. There were numerous research workers coming to the laboratory for various periods of time. Dr. Eric Boyland, known for his work on the metabolism of carcinogenic agents, now connected with Royal Cancer Hospital in London, Dr. Eric Jacobson, known for his work on Antabuse, now Professor of Pharmacology, Royal Danish School of Pharmacy, Copenhagen, Denmark, Professor D. Nachmansohn, known for his work on the transmission of the nervous impulse now Professor of Biochemistry at Columbia, Dr. Donald MacEachern who worked on the metabolism of the brain but, unfortunately died early, Dr. Arthur Grollman, known for his work on cardiac output and pharmacological agents used in hypertension, now Chairman of the Department of Experimental Medicine at the University of Texas in Dallas, Texas. Also, prior to 1931–32 Professor Meyerhof had numerous students who now occupy important positions in medical research, for example, Ralph Gerard, Harold Himwich, Francis O. Schmitt, Fritz Lipmann, Severo Ochoa and E. Lundsgaard. Mention must be made of Mr. W. Schulz, a well trained technician, who carried out the chemical determinations for Professor Meyerhof and whose name appears on numerous papers with Professor Meyerhof. He was also expert in the construction and use of labora-

tory apparatus. There were also two well trained technicians in the laboratory who were able to construct excellent equipment.

Professor Meyerhof ran what the Navy would call a "tight ship." His associates would await his arrival in the morning and as he was seen approaching on bicycle the cry would go through the laboratory "He comes". There would be much attention paid to reading thermometers and the pouring of solutions from one beaker to another. The laboratory was divided into two floors, with the visiting research workers in a large room equipped with chemical benches on the first floor and the private laboratories and offices for Professors Meyerhof and Lohmann on the second floor. On entering the laboratory, Professor Meyerhof would make the rounds on the first floor, asking each worker in turn the same two questions every day, "What did you do yesterday?" and "What will you do today?" He would then discuss the results of yesterday's work in light of the general problem and would outline the work of the day. If some one was absent, he would inquire about the missing worker. After he had completed his rounds he would go upstairs where he would work for one-half the day in his laboratory and the other half in his office writing papers for publication. If, on his rounds, he was satisfied that a worker had sufficient material for publication, he would take the data and later an article would ap-

pear in the *Biochemische Zeitschrift* with the worker's name and with or without the name of Meyerhof. He did not like to be disturbed after he had made his rounds. It was well to hold any questions until the following day when he was again making his rounds.

His laboratory at that time was designed around experiments with the Warburg apparatus, phosphate and lactate determinations. Each new worker was given a lactate sample to analyze, and, if the analyses checked, he was then given a problem. If it did not check he was told to continue to do lactate analyses until he acquired sufficient skill. Professor Meyerhof was in close touch with Professor A. V. Hill in London and they correlated their work very closely. For example, Professor Hill had published a theoretical paper on the diffusion of oxygen into a muscle (1928) and had speculated on the possibility of exhausting the carbohydrate supply of muscle by long continued slow stimulation of muscle. Professor Meyerhof gave me this problem to do experimentally. The problem involved stimulating the sartorius muscle of a frog in oxygenated Ringer's solution for periods of sixteen to twenty-four hours. Close correlation (Gemmill, 1932) was found between the experimental results and Professor Hill's theoretical calculations. Later, he gave me the problem of measuring the change in oxygen consumption with variation in initial tension in muscle. His mechanic had constructed a delicate platinum muscle lever mounted in a Warburg vessel. It was so arranged that the tension on the muscle could be varied by a micrometer screw. I had to return to Baltimore before the experiments were completed. Professor Meyerhof gave this problem later to Dr. G. Benetato from Rumania. The results (Meyerhof, Gemmill, and Benetato, 1933) were published with our three names on the paper. It was not until several years later that I met my coworker

in Leningrad, Russia. He now holds a responsible scientific position in Rumania and I have seen Professor Benetato at several International Meetings.

Heidelberg at that time was a quiet country town with not many other interests beside the laboratory. The country side was good for bicycle trips, the beer halls were comfortable and food and rooms were reasonable. In fact, I had room and breakfast for the equivalent of 25 cents a night and meals at a restaurant called the Kaiser Hof were available at 20 cents a meal. They served a Kaiser Hof Special which consisted of a big slice of rye bread, covered with ham, with onions and pickles around the plate which was sufficient for a lunch.

Professor Meyerhof was not given to lighter moments. The nearest thing to a light remark was that he said of a certain man working on a biochemical problem involving eggs, "You always know where he works, there is egg on the floor." He did invite us to his home for a dinner and talked on philosophy in which he had a deep interest. I remember his daughter, Bettina, coming around the corner into the dining room and saying "Now don't eat up all the ice cream." This daughter came to America, received her M.D. at Johns Hopkins and is now in practice in Bellevue, Washington. At the International Physiological Congress in Rome in 1932, he invited his workers to a delightful meal at Alfredo's.

Professor Meyerhof had strong personal likes and dislikes. Embden was one of his dislikes when I was in Heidelberg. It is of interest that their two names are linked together in the Embden-Meyerhof pathway. C. F. Cori and A. B. Hastings were the two scientists that he admired in the United States. Professor Meyerhof used to mark the papers that he read in the journals. Only the papers of Cori and Hastings were marked in the American journals.

Professor Meyerhof's laboratory represented the Institute approach with all of the workers devoting their attention to the several aspects of the single problem of muscle metabolism. The number of papers (Meyerhof, 1930) and the great contributions from this laboratory represent the results of the dominant personality of one man. The tributes (Nachmansohn, 1950) paid to him in 1950 were published in *Metabolism and Function*. Comparable tributes are now being given to Dr. Fischer upon his retirement.

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Ambulatory Services in Teaching Hospitals

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The outpatient clinics and emergency rooms of metropolitan teaching hospitals have been criticized severely in recent years for providing poor patient care. In most teaching hospitals the ratio between outpatients and inpatients is three to one; therefore, if the critics are right, 75% of the patients who obtain medical care at the teaching hospital, are not getting the best that medicine has to offer today.

PROBLEMS OF OUTPATIENT CARE

To support their allegations the critics offer these comments: patients are herded into austere facilities where each step in medical care is preceded by hours of waiting; the atmosphere is impersonal; hospital employees are unsympathetic, discourteous, and condescending. Patients are subjected to many indignities, and many of the individual's needs are overlooked because there is too much emphasis on pathology and not enough understanding of the person who has the disease. The patient is passed from one specialist and clinic to another, and at each visit he receives attention to a single facet of his total problem. There is little direct communication between the specialists and consultants so that their opinions and treatments often clash and leave the patient confused. There is no continuity of care because the patient sees a different physician at each visit and cannot establish effective rapport with them. The supporting clerical,

diagnostic, and ancillary medical services are disorganized so that delays, mistakes and missing reports or records are common. Expensive tranquilizers have replaced common-sense psychotherapy and physician-patient rapport. Laboratory tests and x-rays have increased in number as histories and physical examinations have grown more superficial. Physicians spend less time with the patient than they do reading or writing about him in his chart.

Medical educators are concerned because students are exposed to such poor examples and methods of medical practice. Sociologists point to the teaching hospital's preoccupation with research, education and the horizontal inpatient with florid disease, while the indigent, ambulant patient is neglected. They complain that the hospital remains aloof from many community needs and the problems of patients with chronic disease, psycho-physiologic ailments, emotional difficulties, and socioeconomic hardships.

Hospital administrators have become uneasy about the cost of providing outpatient services and are reluctant to expand or renovate the ambulatory departments where ill-feeling, emotional strain, and financial deficits are generated so often.

Physicians themselves are very critical of the conditions which prevail in the outpatient services. The part-time faculty clinician, who must toil there to preserve his privileges, enjoys almost no intellectual rewards and experiences a

In recent months, care of the sick in the U. S. has received considerable attention from the Government, Congress, and various professional organizations, and has sometimes come under strong fire in the press.

We publish the following reports, without necessarily endorsing any of them, in the belief that physicians are interested first and foremost in providing the best medical care, and that, rather than fearing or resenting honest criticism, they Welcome it.—Ed.

great deal of frustration. He feels like a second-class citizen in an environment where outpatient care is considered relatively unimportant and where his clinical skills are overshadowed almost completely by the ingenuity of the research-oriented, full-time faculty member. Discouraged by this, he needs little excuse to forsake the clinic as often as possible and to seek refuge in his own practice.

RESEARCH IN PATIENT CARE

A decade of research and top-level discussion has left little doubt that there is much truth in these allegations. In one study, patients who had been attending a university hospital's clinics for two years were re-evaluated (Lashof and Turner, 1964); a surprising number were found to have undiagnosed diseases—diabetes mellitus, hypertension, urinary tract infections, anemia, and visual loss due to cataracts. The patients' charts contained abnormal laboratory reports which had been ignored; perhaps the physician who had ordered a test failed to record his clinical suspicions or did not see the patient again, but, whatever the reason, the unread laboratory report represents time and money wasted, to say nothing of the serious consequences for the patient.

Other studies have shown that the average outpatient makes contact with twelve different persons, employed by six or eight separate hospital departments, at each visit (Deitrick, 1966). This may indicate that the ambulatory services have adopted assembly-line techniques to cope with the overwhelming volume of work. Twenty-five percent or more patients break their appointments and, while this is possibly their own fault, the uncooperative attitudes among them may result from their past disappointments with outpatient medical care.

Work in the U.S.A. and England showed that less than one percent of the sick persons in a community

seek medical care in the teaching hospital and then usually because of advanced or uncommon diseases (White, Williams, and Greenberg, 1961). The university hospital's patient population is not only a highly selected one from the socioeconomic standpoint, but also one which does not represent the true picture of illness in the community. Perhaps it is true, then, that the medical school's educational programs and the faculty's interests are not geared to community problems and needs, and that the medical student obtains a distorted view of medical practice which will leave him unprepared to recognize early symptoms and to treat minor ailments, chronic disease, or psychophysiologic problems.

It has also been discovered that many so-called indigent patients, who frequent the teaching hospital's outpatient departments, also use private physicians and other hospitals (Solon, Sheps, and Lee, 1960). In fact, the teaching hospital may be neither the sole nor the central source of medical care for many of them. It is therefore unwise to assume that a given patient has adhered to the treatment which was prescribed at an earlier visit to the clinic, and that his progress reflects the influence of that treatment upon his illness. It is tempting to wonder how much elegant research work has been based on the false or incomplete clinical information recorded in hospital charts.

COMPARISONS WITH PRIVATE MEDICAL CARE

All of these criticisms may be summarized by saying that the practice of medicine in the outpatient clinics and emergency rooms lacks many of the elements which physicians value so highly in their private practices—comfortable and attractive surroundings, personal and individual attention for each patient, continuity of care, well-organized supporting diagnostic

and clerical services, well-coordinated methods of referral and consultation with effective communication between physicians, comprehensive evaluation of all the factors playing a part in disease and recovery, and treatment which is tailored to each patient's individual needs and circumstances.

Obviously, the conditions which prevail in the out-patient setting are vastly different from those in private practice: the patients belong to a different socioeconomic group and lack the educational or cultural background for excellent cooperation and understanding between physician and patient. However, the most important difference is that the patient load in most teaching hospitals has grown beyond manageable proportions, and the teaching hospital plays a role in the health-care of a community which differs from that of the private practitioner not only in size but also in the breadth of responsibility and obligation.

SUPPLY AND DEMAND

It is precisely because of these differences that the teaching hospital has evolved existing methods of patient care; faced with a tremendous consumer demand, the teaching hospital was almost forced to adopt assembly-line methods. Since it could not turn patients away, it distributed the available supply among all the consumers and had to be content with giving to each half a loaf rather than the whole. Medicine is a service, not an end-product, and medical care cannot be distributed by the industrialist's mass production methods. The fundamental problem lies in finding methods by which medical care can be improved and distributed widely without sacrificing those qualities which make it a personal and individual service. It is rather easy to say glibly that consumer demand has outgrown the supply, but it is very necessary to analyze the reasons for this before the answers to

the problem can be found. To be sure, the population explosion accounts for a large part of the problem, but medicine itself can also be blamed for some of the trends.

HISTORICAL DEVELOPMENT OF OUTPATIENT DEPARTMENTS

In this connection the views of the historian and sociologist are most interesting and bring out the irony of the situation. The short-term general hospital emerged relatively recently—in the mid 1800's approximately—after antisepsis and anesthesia had arrived on the scene. Before that time hospitals were charitable institutions caring mainly for the crippled, blind, insane, and the destitute. When hospitalization became relatively safe and practical, physicians began to congregate patients in hospitals but, even then, hospitals cared mainly for the poor; it was late in the 1800's before private patients were accommodated. With the growth of hospital-based medical schools, charity patients became "teaching material"; outpatient clinics provided after-care for discharged patients, and found new cases for the teaching program. This arrangement was mutually beneficial, the teaching hospital enjoying a ready supply of teaching material, while the indigent accepted gladly the free services of reknowned physician-teachers. It was in the outpatient clinics that many famous physicians made classical observations about the course, natural history, sequelae, chronicity, and prognoses of disease. They used well both the inpatient and the outpatient services to instruct their students and to sharpen their own abilities; fame and respect were their rewards, and the honorary appointment to a teaching hospital was a prize to be sought and enjoyed.

PRESSURES OF THE 20TH CENTURY

The 20th century brought many

new pressures: population growth and the economic depression swelled the ranks of those who sought care in the clinics. Meanwhile, the criteria by which persons were judged indigent were relaxed; the new concept of "medical indigency" allowed many to qualify for free or cheap outpatient services even though they had jobs, property, and many material comforts. At the same time, physicians were advocating prevention and early diagnosis, proclaiming their new scientific successes, and inviting the public to avail itself of the offerings. Ironically, the same scientific progress that spurred consumer demand thinned the ranks of the physicians who were to deliver the service: scientific medicine sired specialization; the generalist all but disappeared; general practitioners retreated from academic halls, and their numbers declined; medical education became increasingly exacting and expensive; teachers of medicine focussed sharply on the inpatient and the laboratory; and the part-time clinical teacher gave way to the full-time clinical specialist and medical research scientist.

Soon there were not enough beds to accommodate the sick, and not enough physicians to treat them at home. More patients could be, and had to be, treated as hospital outpatients. They spent less and less time in bed, more and more time in the clinics; now that death could be averted more often, more diseases entered their chronic phases, and more old people arrived on the scene. Meanwhile, the full-time physician-teacher had to withdraw from the outpatient arena to devote all his time to the horizontal inpatient, his research projects, and that small specialty clinic which he had to protect jealously from too heavy a patient load lest this interfere with teaching.

THE EMERGENCY ROOM PROBLEM

Realizing that a breakdown had

occurred in the supply lines, patients flocked to the emergency rooms where, at first, they could expect reasonably quick attention without the customary financial inquisition, a fairly complete evaluation with all consulting services readily available, and the convenience of unlimited credit because no one dared mention money when a life was at stake. In just a few years visits to emergency rooms multiplied 400% or more, half the patients having no urgent problem and enjoying the luxury of medical attention when the day's work was done or the weekend had arrived. Only the keenest eye could now distinguish between an emergency room and a clinic; both appeared to give identical care to the same patients, both underwent physical decay, and neither achieved its goals of good patient care or teaching.

Even at this point, some physicians could not agree that conditions were bad. There were differences also between clinical departments in the medical school: by and large the surgically-oriented specialties had been able to cope with the increasing volume of work because they spent less time, appropriately, in "work-ups;" dealt more often with short-term, curable disease; discharged many of their patients completely from medical supervision; had insatiable needs for operable cases; and generally avoided extensive involvement with problems which were not related closely to the presenting or major disease. Internists, pediatricians, and psychiatrists, on the other hand, could not adjust effectively to the load. Saddled with more chronic disease in older patients and more complexities in their patients' lives, to mention but two outstanding problems, they found themselves totally swamped.

The future holds evidence of even greater activity in the whole field of health care: more patients, more children, more aged patients, more chronic disease, greater public interest in early diagnosis and

treatment, more attention to minor illnesses and injuries, expanding medical insurance programs, and increased public purchasing power through economic growth and financial assistance. Little is known about the prevention of the degenerative and malignant diseases which account for so much morbidity and mortality and, even if preventive medical programs were expanded, these would increase rather than reduce the personnel required for vaccination, disease detection, and prophylactic treatment projects.

ROLE OF THE TEACHING HOSPITAL

These are indeed critical times for teaching hospitals and the situation demands early solutions, realistic reappraisal of the teaching hospital's role in health services, and the application of imaginative plans in the outpatient departments. There is one fundamental issue, however, which clouds all others and obstructs a clear view into the future: it relates to the teaching hospital's view of its obligations to the public. At one extreme one finds people who feel that teaching and research are the primary goals of the university hospital. To them patient care is a necessary but secondary objective which they would limit quantitatively to those patients who are needed for the educational and research programs. At the other extreme there are physicians who regard patient care as the primary purpose of any hospital, with teaching and research as important by-products of patient care. Between these two extremes lie shades of opinion and compromise, each containing elements of false reasoning.

It therefore becomes necessary to restate medicine's purpose—to restore health. Neither medical education nor research is an end in itself; their ultimate purpose lies in their application to patient care and so the latter should still be the primary

goal of physicians and hospitals. The other functions of a teaching hospital—research and teaching—are additional goals, not substitutes for patient care. Using this as a basis for their reasoning, some have said that the teaching hospital has an inescapable obligation to provide medical service for its community, and that it cannot limit its patient population, particularly when it is supported wholly or in large part by appropriated tax revenues. Others refute this by saying that the teaching hospital in these circumstances represents the public's investment in a health care facility; therefore, it is the extent of the investment which determines how much medical service can be distributed and how well it can be done. The public, through its legislative representatives, has placed its own limits upon the teaching hospital's effectiveness. It appropriates a certain fixed, and usually inadequate, sum of money to the hospital saying, in effect, that it can afford only as much medical care as the money will buy. The hospital therefore has ample reason to place limits on the availability of its services. The teaching hospital must divide its grant from the public between patient care, teaching, and research, but here again the fundamental issues are misunderstood.

FACULTY MANPOWER

Government appropriations for the purposes of teaching are often estimated according to the numbers of faculty members needed to teach a given number of students, and it is not always understood why there have to be as many faculty members as students. The answer is very simple: faculty members spend most of their time caring for several hundred thousand patients while they teach. This basic difference between medical schools and most other schools needs to be emphasized much more than it has been. Teachers of law are not required to

fight cases in court all day long; professors of engineering are not expected to build bridges or machines; teachers of architecture are not expected to design buildings; schools of fine art are not required to turn out paintings, musical compositions and plays—but teachers of medicine are required to heal the sick and to teach while they do so. Therefore, the size of a medical school's faculty should be based upon the numbers of patients served, not upon the number of students taught. Until the medical school is permitted to double or even triple its faculty and to employ more general clinicians, there will be no solution to the dilemma in the outpatient services.

LIMITS TO PATIENT CARE

When the problems of the outpatient clinics and emergency rooms are viewed in this light, it is clear that the public itself is setting limits on the quality of patient care by denying the teaching hospital sufficient funds to operate well. How unrealistic it seems, then to expect an already over-extended faculty to become community oriented and to worry about the sick who do not seek medical care as well as those who do. Every physician subscribes to this idealism but, in the face of the policies governing appropriations to teaching hospitals, the achievement of these ideals is remote. Not only is there insufficient money to give adequate patient care, but there are never any additional funds to expand or improve existing facilities, to study problems, to start pilot trails of new ideas, to replace or purchase new equipment, and to hire sufficient numbers of well-trained clerks, nurses, and ancillary medical personnel. Business and industry owe much of their success to their continual re-appraisal of services and products, and invest large sums of money in these self-evaluation procedures. The teaching hospital, however, is asked to render superb

service, but the money needed to institute new techniques, methods, and services and to experiment with new ideas is never available.

LONG-TERM SOLUTIONS

The long-term solution to the national problem of expanding consumer demand for medical services lies in the education of more doctors, nurses, and ancillary medical personnel, in the enlargement and proliferation of schools for this purpose, in the building of more hospitals and the renovation of existing ones, in greater recruitment of personnel for the health professions, in the training of more doctors specifically for family and general practice, and in the expenditure of huge sums to achieve these aims.

But the teaching hospital cannot wait for these long-term solutions to meet the present crisis in its ambulatory services and, for that matter, in nearly every aspect of its activities. It knows now that quality and quantity are compatible objectives only to a certain point; it should know that its obligations to the community are limited and the limit is determined by its operating budget. It should not try to calculate how many patients it needs for its educational programs (different departments will come up with different answers anyway), but it can calculate very easily that x number of dollars will purchase y number of patient visits. Having determined the patient load which its budget can support, it has every right to tell local government to assume responsibility for the patients who cannot be accommodated. When such a step is contemplated, a method must be devised whereby the patients themselves will not suffer unduly from the teaching hospital's refusal to treat anyone and everyone.

SHORT-TERM SOLUTIONS

The most obvious problem facing the teaching hospital's outpa-

tient department is that it has had to assume responsibility for the general and specialized medical care of a large medically-indigent section of the metropolitan population. Yet, despite this new and expanded role in the area of general practice, the teaching hospital has failed or refused to organize within its walls a facility for general practice. Instead, it has allowed its emergency rooms and specialized clinics to become swamped and misused.

The attack upon the outpatient problem must therefore begin with the organization of a system of medical care at the general practice level which will protect the emergency rooms and specialized clinics from misuse. This can be accomplished in three steps:

(a) *By establishing a clinic for screening, primary evaluations, and general practice:* Ideally this clinic should have the capacity to deal with a hundred or more patients per day. All patients who present themselves for treatment without prearranged appointments should be seen by a screening physician with considerable experience. True emergencies should be allowed direct access to the emergency rooms, and the definition of an "emergency" can be broad enough to include minor cases of trauma or poisoning as well as illnesses characterized by chest pain, abdominal pain, bleeding, dyspnea, shock, disorders of consciousness, high fever, convulsions, paralysis of body functions and so on.

All patients with non-emergency problems should be interviewed and examined in the screening area; x-ray and laboratory facilities should be available there to complete a primary evaluation equivalent to that made by a competent general practitioner. This clinic should function also like a group practice so that the generalists who staff the area, and their interns and residents, have direct access to consultants from the various specialties. The consultants should come to the patients, give their advice, teach the

generalists and housestaff while they do so, and plan with them an orderly program of management for the individual patient. The consultants will have the opportunity to identify patients who require specialized care and to prevent unnecessary referrals to their own clinics. If this general practice or primary evaluation and screening clinic were headed up by a competent general practitioner, he could develop a department or division of general practice with responsibilities and jurisdiction confined to the outpatient setting. He could also develop his own internship and residency programs for family and general practice, and make available for the school's continuing education program an area where general practitioners can receive refresher courses and training.

The patient would benefit enormously from this arrangement since his evaluation by the generalist and consultants is completed in one or two visits. Moreover, the physicians would be in direct contact with one another, thereby obviating the need for much writing and repeated review of the history. If this clinic also had the services of dietitians, social workers, rehabilitation experts, family counsellors and public health nurses, the medical services would be truly comprehensive and oriented toward individual, family and community needs.

Competent residents and trainee fellows could function effectively as consultants at this level of medical care, and a clinic such as this could easily become a good teaching model offering excellent experience in ambulatory medicine and consulting practice.

Since the teaching hospital, through the medium of this clinic, would be making a sizeable contribution to community health, it could ask local government to finance the project. Funds should be sufficient to build the facility initially and then to equip, staff and

maintain it properly. This facility must remain open all the time, with a skeleton staff during nights and weekends when patients would receive only interim care to tide them over until the next full working session on a weekday.

(b) *By establishing or reorganizing a general service or routine after-care clinic:* After the primary evaluation has been completed and definitive management has been instituted, patients could be referred to a general service or follow-up clinic for routine after-care. This, also, should be financed by local government. A facility like this exists already at the Medical College of Virginia and at other teaching hospitals, but it functions poorly for several reasons. It is closed during the day and on certain weekdays; it lacks adequate laboratory, x-ray, and ancillary medical support. Patients have to make another visit to receive certain tests and a third visit to learn the results of those tests. Many patients are afraid or unable to attend the clinic in the evenings. A different physician sees the patient each time he attends, and far too many patients are crowded into each session.

If its hours of operation were expanded, and if each physician were assigned to a group of patients for whom he remains the central medical figure, the general service clinic would improve greatly. Experience has shown that the general service clinic is located best near the outpatient department of the teaching hospital so that patients' records can be obtained easily and quickly from the central record room.

Since local government cannot recruit enough physicians to staff a general service clinic, it has employed the teaching hospital's residents. As long as the service clinic remains a poor after-care facility, serious objections can be raised to this arrangement because it encourages or allows the residents to practice an inferior brand of medicine while they are being trained

toward excellence. If, however, the service clinic were organized properly it could be argued strongly that it provides the housestaff with a learning opportunity in long-term medical care.

(c) *By establishing satellite clinics:* Local public health departments should establish satellite clinics in heavily-populated and economically-depressed areas for the primary evaluation and care of minor illnesses, well-baby care, preventive inoculation programs, routine ante-natal and post-natal care, and home care programs. These clinics could be operated jointly by local health departments and the medical school's department of preventive medicine and public health. Medical students could work in these satellite clinics with public health nurses, social workers, welfare officers, and specially trained medical orderlies like those which the armed forces have trained for the Special Forces' projects in Viet Nam.

The satellite clinics would help to decentralize routine health services, thereby preventing congestion in the teaching hospital's outpatient clinics and emergency rooms. They would also prepare the way for the establishment of a regional health center program such as that envisioned by the federal government. It is not unlikely that federal funds could be obtained for this purpose.

In essence, then, three steps can be taken to protect the teaching hospital's emergency rooms and specialty clinics from indiscriminate overuse. A system of medical care is established which reaches out into the community from the teaching hospital and fills the gap which now exists in general medical care. By this mechanism the emergency room resumes its former role as a precious, life-saving facility which stands ready to handle any major disasters in the community.

Much has been written and said also about the emergency room's role in comprehensive medical care. To illustrate this, Dr. George James,

former Commissioner of Health for the City of New York, now dean of the new Mount Sinai School of Medicine, questioned the value of treating an old lady's cut finger while ignoring her poor eyesight and a carcinoma of the cervix (1965). His point was that medical care in the emergency rooms is so oriented toward the presenting complaint that diseases are ignored which have far greater significance for the patient's life. This situation has arisen because of the unprecedented misuse of the emergency rooms. If the routine, minor, and non-emergency work were removed to a more appropriate setting, every patient who truly had an emergency could be evaluated thoroughly. The emergency room simply cannot do everything for everybody, nor should it do something for everybody. It is much more logical to protect it so that it can do everything for some people, those who really need emergency care. Furthermore, the days of the general emergency room are numbered. It makes no sense at all to drain abscesses where clean wounds are sutured, to treat pregnant women where D.O.A.'s are pronounced dead, to examine children where belligerent psychotics and alcoholics are seen, and to expose psychiatric patients to the sights, sounds and tensions of the general emergency room. The time has arrived to split the emergency service into several sub-parts—one for pediatrics, one for obstetrics and gynecology, one for psychiatry, one for the management of shock and trauma, and another for the treatment of acute illnesses in adults (a joint medical-surgical facility). In this way patients go directly to the physicians who are most competent in a particular area, with great benefit for the patients and much saving of time and unnecessary toil. Moreover, those emergency rooms should be located conveniently near each other so that they can be served by a central, special laboratory and x-ray unit.

SUMMARY

Space does not permit the exploration of other possible short-term solutions; only those which appear to offer dramatic improvements have been discussed. It is important to recognize that local government must be induced to make much larger contributions for health care and to assist the teaching hospital in establishing a pattern of medical care in the community which is oriented toward the public's needs and the teaching hospital's purposes. If local government cannot be induced to make these contributions, the teaching hospital will be forced to restrict its services. This, in turn, may mean a much larger expenditure by local government authorities to establish separate health-care facilities without the cooperation of the teaching hospital.

Having established a system for general and routine medical care in the community, the teaching hospital is then in a position to resume its special function as a referral center. Its specialized clinics could then concentrate more effectively upon complicated or difficult medical problems and improve both teaching and research in those areas.

The medical school, meanwhile, must impress upon government bodies its realistic needs in terms of physician manpower. The imbalance between research-oriented specialists and clinical generalists, which now exists in medical school faculties, should be corrected so that a larger section of the faculty will be available to participate in actual medical practice. This, in turn, would free the research scientist from patient-care duties which he now performs somewhat reluctantly. The time has arrived to distinguish clearly between those full-time faculty physicians who must do high-powered research, specialized teaching, and specialized patient care and those who must do general patient care, general

teaching, and research into methods of patient care.

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