it can guide to fruitful research in the future. As never before, the geologist realizes the meaning of the ancient maxim, "deep calleth unto deep," the need of seeking in the shells and core of the earth explanation for the dramatic changes registered in its relief and visible rocks.

A PROGRAM OF MEDICAL CARE FOR THE UNITED STATES

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IN every field of human activity we are to-day facing one common problem—the problem of adjusting our social order to the altered conditions produced by a revolution in technology. "Neither do men put new wine into old bottles; else the bottles break, and the wine runneth out, and the bottles perish: but they put new wine into new bottles, and both are preserved."

The traditional relationship between a physician and his patient, for example, was admirably adapted to the conditions of a century ago. It was indeed one of the finest and most fruitful examples of human relationship which one could well imagine. The physician practiced an art over which he had complete control and mastery. In his head he could carry all the knowledge then in existence and in his black bag all the paraphernalia available for the healing of the sick. His profession was a priestly mission, not a business. He cared for all who were in need of his ministrations. Those who could pay nothing paid nothing and those who could contributed in proportion to their means for the support of an honored servant of society. The physician and his patients were neighbors and friends. They knew each other intimately and for a lifetime, and the adjustment between service and recompense in a given case was made almost automatically.

This is, of course, an extreme statement of the actual situation; but it represents an essential ideal which underlay the relation between the doctor and his patient at the dawn of the machine age. It is a relationship which still exists to-day. Most of us know physicians and patients who maintain contact on the same elevated plane. Yet it would be safe to say that such a relation is rare and is becoming more rare with the passing of the years. This is due first of all to changes in medicine itself. The old art is now also a new science. No longer can one man understand it or practise it by himself. There must be specialists and consultants of many and diverse kinds (some twenty-five such specialties are now recognized). There must be well-equipped and costly hospitals. There must be nurses. There must be laboratories and laboratory technicians. There must be physiotherapy, devices of numerous kinds and special experts to use them. There must be x-ray machines and radiologists.

Equally fundamental in their influence upon the older ideals of medical practise are the changes produced by technology in the general social order itself. The old neighborhood life has gone and with it the intimate and prolonged personal contacts which made the old relationship between physician and patient simple and easy of attainment. Still more deeply is this relationship affected by the subtle forces of a society dominated by the profit-motive in which as John Dewey has pointed out in "Individualism Old and New," old motives of social responsibility have disappeared and new ones have not yet been developed to take their place The physician finds himself half priest and half business man, a servant of society in a world which has ceased to recognize service except as measured by financial return, a business man in a field where the fundamental requirements of basic human need preclude the application of ordinary principles of economic individualism.

It is characteristic of the forces which dominate our civilization that the impulse which actually precipitated a broadly conceived study of this vital social problem was largely an economic one. It was primarily wide-spread complaint of the financial burden of illness on the one hand and legitimate dissatisfaction on the part of the professions and agencies furnishing medical service on the other which led to the formation on May 17, 1927, of the Committee on the Costs of Medical Care. From the first, however, the committee realized that it was impossible to consider costs without considering quality as well and it has set as its ultimate goal the "development of preventive and therapeutic services in such kinds and amounts as will meet the needs of substantially all the people" and the provision of such services "on financial terms which the people can and will meet, without undue hardship, either through individual or collective resources."

The committee, which made its final report on December 29 last, was composed of 48 members under

the chairmanship of Dr. Ray Lyman Wilbur. Twenty-five of its members held the degree of doctor of medicine. Analyzed in another way, seventeen were private practitioners of medicine and dentistry, ten were representatives of institutions and special interests, six were public health workers, six social scientists and nine representatives of the general public. Funds for research were obtained through the generosity of eight foundations, and many other agencies have cooperated whole-heartedly in the conduct of special studies. An administrative staff was organized under the leadership of Harry H. Moore, whose vision has throughout been the inspiring force in the work of the committee. A brilliant research staff under I. S. Falk has been responsible for the actual conduct of the detailed investigations. The studies have been completed on schedule time (an almost miraculous result!) and have been published in 27 volumes.[1] The twenty-eighth and final volume, "Medical Care for the American People," is the report of the committee itself, signed by 35 of the 48 members of the committee. Minority reports were presented by two groups (one of eight physicians and an institutional representative, the other of two dentists) who find the report of the committee too radical; special minority statements were presented by a public health worker and a social scientist who find it too conservative.

In analyzing the findings of the committee it will be well to begin with one study which has received as yet but little attention but which should ultimately prove of far-reaching significance. This is Report No. 22 on "The Fundamentals of Good Medical Care," by Roger I. Lee and L. W. Jones. It gives us first an analysis of the number and kinds of illnesses to be cared for in the United States, second, an estimate of the amount and kind of medical care (home and office visits, laboratory tests, x-rays, days of hospital care, etc.) required by the average illness of each type. From these data the number of general practitioners, specialists, dentists, nurses, hospital beds, etc., needed for a given population are then computed. These analyses lead to the encouraging conclusion that a slight increase in medical personnel (with a considerable decrease in specialists), a very slight increase in nurses, and a considerable increase in dentists would be needed to meet the ideal needs of the American people for complete and adequate medical care. With proper organization they estimate that such complete care (preventive and curative, including effective health service and all nursing and hospital costs and charges for drugs) could be provided at an average cost of $36 per person per year.

The actual expenditure of the American people for medical care is to-day very close to this sum—$3,656,000,000, or $30 per capita; but the actual service rendered is very far from the adequate care which could be purchased for such an amount. The committee has obtained a remarkably clear picture of the existing situation. It has first of all (in Study 26) made a study of medical costs during a twelve-month period in nearly 9,000 families, representing various geographical areas and various economic levels; and it has supplemented this by intensive studies of community facilities in Shelby County, Indiana, the city of Philadelphia, the city of Detroit, San Joaquin County, California, the state of Vermont, and three representative southern counties (studies 6, 9, 10, 12, 13 and 23). These investigations reveal the following outstanding deficiencies in the present status of medical care.

A. *Maldistribution of facilities in various geographical areas.* These may be illustrated by the fact that in 1929 there was one physician to every 1,431 persons in South Carolina and one to every 571 in California; one dentist to every 5,274 persons in Mississippi, and one to every 990 persons in Oregon; one hospital bed to every 749 persons in South Carolina and one to every 154 in Wisconsin. Conditions in the Southern states are nothing less than appalling.

B. *Maladjustment of services in all areas.* In the rural areas, even where general practitioners are available, there is grave lack of hospital and laboratory facilities and of consultation service; and even in cities many physicians lack the hospital connections which would make the most effective work possible. On the other hand, the cities as a whole show a markedly excessive development of specialization. Forty-five per cent. of the physicians of the country have completely or partially limited their practise to a specialty, where we estimate that 18 per cent. would suffice for the real needs of the situation. Some patients suffer from lack of specialist service and some from too much.

C. *Waste in the provision of service.* There is wide-spread waste of time and of overhead costs in the rendering of service on an individual basis. About 40 per cent. of the average physician's income is consumed in overhead expense. The average physician also, particularly in the years immediately following graduation, wastes a large part of his time in waiting for patients, while the older man with unusual capacity in some particular field wastes much of his time in routine functions that a younger man could perform quite as well.

D. *Unwise expenditures for medical care.* Of the total of $3,656,000,000 a year now spent by the American people for medical care, 360 million dollars go for "patent medicines" and 125 million dollars for the services of cultists and irregular practitioners who

[1] The University of Chicago Press.

have never studied the human body and do not understand its working.

E. *Economic burden of emergency illness.* The average expenditure of $30 per capita per year does not seem exorbitant. It amounts to about 4 per cent. of the national income, less than we pay for household furnishings and supplies, less than half we pay for automobiles and only slightly more than we pay for recreation or for education or for tobacco, confections, ice cream and soft drinks. Such an average, however, gives no picture whatever of the actual situation. The other items mentioned can be predicted and budgeted; but sickness can not. Our studies bring out the astonishing fact that in the group of families with incomes under $2,000 a year (about half the population of the United States) one per cent. of the families spent over $500 in one year for medical care. It is this hundredth family (over one million of them in the United States in a given year) which contributes from one quarter to one half of its annual income to meet the emergency cost of illness which constitutes the critical economic problem in the field of medical care.

F. *Inadequate compensation for persons and agencies providing service.* One result of such economic maladjustment is that the compensation of the individuals furnishing service is on the whole inadequate and uncertain. The average net income of physicians in 1929 was $5,300, which may or may not be considered reasonable; but the median net income was only $3,500, and one third of all physicians had net incomes below $2,500. Private duty nurses were in a desperate situation even prior to the depression. Voluntary hospitals in many areas are now in serious danger of being forced to close their doors.

G. *Inadequate care of the sick.* The second result of economic maladjustment is that a shockingly large amount of illness is now actually uncared for (in spite of the potential adequacy of the resources at our disposal). The table below presents some of the most disturbing facts brought out in our study.

Clearly, the common catchword that "only the very rich and the very poor receive good medical care" is only half true. The very rich are reasonably well cared for (except for dentistry) and have slightly more special nursing than they need; but as one goes down in the economic scale the adequacy of care becomes less and less, except that the very low income levels receive more hospital care than those in the middle range. The lower half of the population (below $2,000 annual income) receive only a little over one third of the physicians' visits, less than two thirds of the hospital care, a little over one tenth of the dental care and a little over one tenth of the special nursing care required.

H. *Lack of preventive services.* Finally, there is everywhere a grave lack of the applications of modern medical science to the prevention of disease. We talk about preventive medicine and annual health examinations, but we do not practise them. As long as preventive services are immediately contingent on the payment of a fee for such services they can not be urged by the physician and they will not be sought by the patient.

	Services received in families with specified incomes						Services required by standards of good medical care
	Under $1,200	$1,200–$2,000	$3,000–$5,000	$5,000–$10,000	Over $10,000		
Physicians' home, office and clinic calls per person	1.9	2.0	2.3	2.7	3.6	4.7	5.6
Days of hospital care per person	0.9	0.7	0.8	0.6	0.8	1.2	1.4
Dental care, per person over 3 years of age	0.1	0.2	0.2	0.3	0.4	0.6	1.0
Cases receiving special nursing care per hospitalized case	0.1	0.1	0.2	0.3	0.4	0.7	0.6

So much for the defects in the operation of the general machinery for the provision of medical care to the American people. A second group of studies made by the committee deals with a very different picture found in certain special population groups where experiments have been made in providing medical care on a different basis through organized social planning. Reports have been presented on four different types of services of this kind—industrial medical services providing medical care for employees and their families, conducted by the Endicott-Johnson Company, the Homestake Mining Company and at Roanoke Rapids, North Carolina (Nos. 5, 18 and 20); university medical services at California, Cornell, Michigan, Oregon and Yale (No. 19); service provided for officers and men and their families at an army post at Fort Benning, Georgia (No. 21) and service provided by tax-supported physicians in the rural areas of Saskatchewan (No. 11).

It must not be inferred that the committee presents these instances as necessarily typical of industrial or military or other forms of organized medical care. The programs studied were chosen because they were believed to be good examples and they are significant,

not necessarily as pictures of average organized practise to-day, but as illustrations of what organized practise can accomplish when properly safeguarded.

From this standpoint, the experiments reviewed are highly encouraging. They show us representative population groups which under an organized program are receiving a type of medical care which is free from practically all the limitations operating in the country as a whole. The beneficiaries of these services are receiving a far greater amount of medical care and medical care on the whole of better quality than corresponding economic groups in the general population. The expense of the service provided varies according to its completeness. The rural service in Saskatchewan which covers only home and office calls by physicians costs only about $2 per person per year. That at Homestake which does not cover dentistry or home nursing costs a little over $12. The highly developed and practically complete services of the Endicott-Johnson Company, the Fort Benning Post and the better equipped universities costs from $20 to $30 per person per year. In other words the actual cost corresponds very closely to the average expenditures of the general population at a corresponding economic level; but the service is something like twice as extensive. At Roanoke Rapids, for example, the mill population paid for their organized service $8.72 per capita per year as against $5.17 paid by the rest of the community (the latter being on a slightly higher economic level); the mill group, however, received three times as much hospital care, nearly twice as many physicians' office and home calls and ten times as many home nursing calls as did their fellow townsmen. At Homestake the organized group provided for $71,000 service which at current local rates would have cost $175,000.

The increased values obtained from organized service, in such instances as those cited, are not in any sense derived from exploitation of the professional personnel concerned but by elimination of waste time and needless overhead charges. The salaries of physicians in Saskatchewan and in the industrial and university service cited are well above the average for similar areas, and in general for the country as a whole.

The funds are obviously derived from various sources—from the tax levy in Saskatchewan and at Fort Benning, from the students in the universities, from employer or employee or both in the industries. In all instances, however, payment by the potential patient is on a fixed annual or monthly basis, so that the crippling burden of emergency illness is eliminated. Finally, as the Saskatchewan doctors and the industrial physicians testify with particular emphasis, the removal of the pecuniary inhibition in connection with a particular service makes it infinitely easier on both sides to offer and to receive medical care of a preventive and therefore really fruitful kind.

These investigations have, then, led the committee to its two major recommendations. The first of these is "that medical service, both preventive and therapeutic, should be furnished largely by organized groups of physicians, dentists, nurses, pharmacists and other associated personnel. Such groups should be organized, preferably around a hospital, for rendering complete home, office and hospital care." The chief difficulties which the committee believes can be overcome by group practise are listed as follows:

> The lack of coordination between general practitioners and specialists; the isolation of some practitioners from helpful contacts with their confrères and from hospitals and medical agencies; the lack of adequate supervision and control over the quality of some medical care; the enforced idleness of many physicians because of lack of patients; the difficulty experienced by patients in choosing qualified physicians; the unnecessarily large expenditure for overhead costs made by practitioners in individual private practice; and the increasing complexity of medical service which necessitates the use of ever-multiplying equipment, as well as a larger number and variety of subsidiary personnel.

Secondly, the committee recommends "that the costs of medical care be placed on a group payment basis, through the use of insurance, through the use of taxation; or through the use of both these methods." The argument here is, of course, obvious and inescapable. Only by distribution of costs over a period of time and over a group of families can the crippling economic burdens of emergency illness be avoided. Only by such distribution of costs on a fixed annual basis can the general use of preventive measures be brought within the range of practical possibility.

The ideal of the committee is the development in urban areas of community medical centers organized about existing hospitals. In some instances these would be city or county or town hospitals (particularly in rural areas). More often they would be voluntary hospitals, directed as our non-official hospitals are to-day by a lay board representing community interests. Practically all the physicians, dentists and private duty nurses in a community might be on the staff of one or another of the hospitals, and these staffs would be organized as those of our best hospitals are to-day, so that qualified chiefs of services would be responsible for the quality of service rendered. All professional policies would be directed by the professional groups concerned. Complete preventive and curative care of all types, in home, office and ward, would be provided for one fixed annual

fee. The majority of physicians on the staff would be general practitioners and the individual would choose his own family physician with complete freedom among those available in the centers within his reach.

Such completely equipped centers might serve more than 50 per cent. of the American people who live in communities of over 15,000 or within reach of them. For smaller isolated towns (about 10 per cent. of the population) small branch hospitals could be used, affiliated with the larger centers for consultation service and for the handling of specially difficult cases. For the villages and rural areas (including slightly less than 40 per cent. of our population) still smaller "medical stations" should be established with one or two physicians, a dentist, a trained nurse-midwife and other public health nurses. They would rely upon medical centers or branches for facilities and service they could not themselves supply and would be visited at intervals by specialists from such centers.

The method of accumulating the collective reserves to pay for services would differ with local conditions. In remote rural areas the tax levy (as in Saskatchewan) would seem to be the only promising source. For the indigent in all areas the tax levy would necessarily provide, as it does (inadequately) at the present day. In industrial communities the employer might properly contribute his share, as he often does now. It seems highly desirable, however, for the development of a due sense of personal responsibility that as large a proportion as possible of the costs of medical care should be borne by those who are to receive that care—in other words, by payment from individual families through the medium of an insurance plan.

This is the method which has been universally adopted by the nations of western Europe (in contradistinction to the tax-supported state medical service of Russia and certain other countries of eastern Europe); and, in general, these nations have moved steadily forward from experiments with voluntary group purchase to programs of compulsory state insurance. The committee is nearly unanimous in recognizing that complete coverage of all those who require care can only be ultimately attained in the United States by a system of compulsory insurance. If and when such a program is adopted we trust that insurance for medical care may be sharply and completely separated from insurance covering wage losses due to illness, since we feel that the difficulties experienced in Europe have been largely due to confusion between these two different objectives.

The majority of the committee is not, however, prepared to recommend compulsory sickness insurance in any form at this time—chiefly for the following reason. We do not believe that adequate medical care can ever be provided by private physicians operating on a purely individualistic basis, and if the introduction of compulsory insurance crystallized and fortified the present system of medical practise, we believe that the dangers would outweigh the benefits. We should like, therefore, to see a period of experimentation with voluntary group purchase going hand in hand with the development of group practice so that when compulsion comes the public can contract with well-organized and well-established medical centers and their cooperating agencies. We can begin with industrial groups, church groups, neighborhood groups and other voluntary aggregations, while we are gaining experience in medical organization and in actuarial practise; and that this is not an idle dream is shown by experience in England, where something like six million people are now insured for hospital care in voluntary groups.

The report of the Committee on the Costs of Medical Care has already, in the brief time since its appearance, been subjected to very vigorous criticism. This is highly encouraging, since only platitudes receive easy and general acceptation. Many of these criticisms, however, are obviously made by those who have never read the report, since they condemn it for positions which it does not imply in any shape or form.

We have, for example, been charged in supposedly serious scientific quarters of advocating socialism and communism and of "inciting to revolution." Yet the entire program advocated by the communite is based primarily on group practise in voluntary hospitals and on group purchase by privately organized bodies of citizens. The tax levy is only brought in for rural areas where there is no other source of funds and for the support of the indigent which is already a universally accepted form of socialism. We believe that the policy we have proposed is the only way of forestalling a type of state action which has become almost universal in Europe and which will be inevitable here if such forms of voluntary group planning as we have suggested can not be successfully evolved.

A second ground of opposition to the report is that it advocates a type of group service called by the medical profession "contract practise" which may readily be made the agency of "unfair competition." Here, the whole question hinges on what is meant by "unfair competition." If a group of physicians render a substandard type of service there is certainly unfair competition with their professional confrères. If, on the other hand, a group of physicians is exploited through overwork or underpayment by an industry or some other agency organizing a group, there is unfair competition. Either of these conditions will injure both the public and the profession and should be strongly condemned. But if it be found (as it has

often been found) that a group of physicians can receive ample compensation and yet furnish equivalent care to patients at lower cost than can their individual colleagues in the community, we have a different story. The advantages of group practise which accrue directly from the organized nature of that practise are clearly in the interest of both the profession and the public. No condemnation of "unfair competition" which is based only on such advantages can ultimately be maintained.

Opposition to the plans of the committee is also based on the fear of "lay control" of medical practise. The committee is quite at one with such critics in stating clearly that "lay groups organized for profits have no legitimate place in the provision of this vital public service." On the other hand, it is apparent that in a "vital public service" there are vital public interests at stake. Medicine can not to-day be practised without large capital sums invested in hospitals, laboratories and clinics; and the public must continue to have its voice in the management of such institutions. The combination of a lay board representing the public interests involved and a professional staff in full control of professional policies seems to offer the only rational solution of the problem.

Finally, there is the fear that group practice and group purchase would mechanize medicine and wipe out the essential personal relationship between physician and patient. There is no doubt that this has happened in some group practices, and there is no doubt that where it does happen it is destructive of the essential basis of good medical care. There is no reason, however, why it should happen. It does not appear to have happened in the university and industrial services we have studied or at Fort Benning. It does not happen in many of our best clinics where the appointment system is coming into use. In a properly organized medical center such as we have described the relation between family physician and patient (which has so largely disappeared from private practice in urban centers) could be restored to a new importance and dignity and freed from the constant inhibitions on both sides which are due to the intrusion of the element of pecuniary responsibility at every stage in what should be a free personal relationship.

The committee does not of course recommend the immediate completion of its program on any general scale or indeed in any given community. It does endorse the principles of group practice and group purchase as basic in any sound program of advance; but it recognizes that local differences—social, economic, geographical, psychological—will make widely differing applications of these principles desirable.

The committee recommends "that the study, evaluation and coordination of medical service be considered important functions for every state and local community, that agencies be formed to exercise these functions, and that the coordination of rural with urban services receive special attention." It urges experimentation in the direction of expanding existing institutions, hospitals, group clinics, pay clinics, industrial and university medical services and the like. To readers of SCIENCE it may be of particular interest to note the recommendation that

> The student health services, found feasible in certain universities, may be extended to other universities and academic institutions, and the services made available on a suitable periodic payment basis to faculty members and their dependents and to other university employees and their dependents. In "college towns" it may frequently be feasible to expand the university medical service into a community medical center which serves townspeople as well as students.

To quote again,

> The aim should be to adopt objectives which at present seem sound, and to develop definite and purposeful experimental methods of approaching those objectives, preserving, insofar as it is compatible with effective service, the maximum amount of local self-support, and self-control, and the greatest freedom, consistent with social welfare, for the professions and the agencies involved. Although too great decentralization of authority limits competence and threatens economic effectiveness, too great centralization of authority in any plan carries with it elements of ultimate weakness. Fortunately, we have retained in this country a wholesome local responsibility for medical service. This fact means that opportunities exist for trying out many plans under various and variable conditions. Where action can be limited to the city or county, we have several thousand experiment stations. If state action is necessary, there are forty-eight laboratories.

Experimental social planning along sound theoretical lines, but based on existing American institutions —this is the objective set before us for the solution of the economic problem of medical care.

OBITUARY

ORMOND STONE

1847–1933

AFTER living to the ripe age of eighty-six years, Professor Ormond Stone was instantly killed on January 17 near his home in Centreville, Virginia, when struck by an automobile while he was walking along the road. With his passing, the University of Virginia loses its oldest professor and astronomy a noted figure.