The Boston Medical and Surgical Journal

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May 27, 1915

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Addresses

HOW THE PRACTISING PHYSICIAN MAY AID THE DEPARTMENT OF HEALTH.*

BY ALLAN J. McLAUGHLIN, M.D., BOSTON,

Massachusetts State Commissioner of Health.

THE practising physician has always been a great factor in the suppression of communicable diseases and his importance in public health work has been enormously increased in recent years because of the extension of public health work beyond the communicable diseases themselves.

The work of health departments and health officers has evolved from the suppression of contagious or epidemic diseases into the prevention of all disease and the business of keeping people healthy.

Wonderful progress has been made in the reduction of the general death rate and of the death rate for certain communicable diseases, notably, typhoid fever, tuberculosis and diphtheria.

Two great agencies stand out prominently in considering this great saving of lives, viz: the laboratory and the practical application of demography. Through these great agencies we have secured a better knowledge of the cause of disease, better knowledge of the prevalence of disease, and better knowledge of methods of prevention of disease.

* Read at the Boston Medical Library, February 17, 1915.

The laboratory has given us exact knowledge of the causes of many diseases and has demonstrated how these diseases are transmitted. With this knowledge more precise and effective methods of combating these diseases have been devised and employed. Exact knowledge of the specific organisms which cause Asiatic cholera, typhoid fever, tuberculosis and diphtheria, and of the life history of these organisms, makes it possible greatly to reduce the mortality from these diseases, and to eradicate them under favorable conditions.

In the laboratory also we manufacture antitoxins and vaccines with which we cure or prevent these diseases.

Demography is second only to the laboratory as a factor in the great reductions effected in recent years.

By the practical application of vital statistics we learn in what localities and to what degree these diseases exist and are able to attack them more intelligently. These statistics also show what results, if any, are being attained.

The progress made and the great reductions effected, especially in typhoid fever, diphtheria and tuberculosis, are due in greatest measure to the improvement in public water supplies, the free use of antitoxin, and the splendid team work of various health agencies against tuberculosis.

The future reductions in the general death rate may be grouped under three heads, viz:—

1. Further reductions in the mortality from tuberculosis, typhoid fever, diphtheria, and some other communicable diseases, to the point of complete eradication.

Years.	Cerebral Hemorrhage. Apoplexy.		Organic Diseases of the Heart.*		Cancer.	
	Deaths.	Rate per 100,000.	Deaths.	Rate per 100,000.	Deaths.	Rate per 100,000.
1895.....	1813	72.5	3566	142.8	1749	70.0
1896.....	2035	79.5	3664	143.3	1798	70.4
1897.....	1988	76.0	3615	139.1	1739	66.5
1898.....	2103	78.6	3618	135.0	1907	71.3
1899.....	2162	78.9	3691	134.5	1838	67.0
1900.....	2161	77.1	3834	136.8	1998	71.2
1901.....	2277	80.0	4368	153.3	2080	73.1
1902.....	2402	83.3	4495	155.7	2141	74.3
1903.....	2434	83.1	4837	165.5	2243	76.8
1904.....	2663	89.8	5342	180.4	2421	81.7
1905.....	2843	94.7	5430	181.0	2501	83.3
1906.....	2855	93.6	5525	181.4	2603	85.5
1907.....	3068	99.3	6155	199.6	2744	89.0
1908.....	2979	95.2	5690	182.0	2814	89.8
1909.....	3128	98.6	5504	173.4	2871	90.6
1910.....	3263	97.0	5706	169.5	3028	90.0
1911.....	3310	96.1	5455	158.2	3199	92.8
1912.....	3496	99.6	6762	192.4	3282	93.5
1913.....	3451	96.5	6869	192.0	3526	98.5

* Includes acute endocarditis.

Year.	Population.	Consumption.		Pneumonia.		Typhoid Fever.	
		Deaths.	Rate per 100,000.	Deaths.	Rate per 100,000.	Deaths.	Rate per 100,000.
1895.....	2,500,183	5486	219	4652	186.3	680	27
1896.....	2,558,437	5536	216	4703	184.3	723	30
1897.....	2,618,048	5431	207	4796	183.5	607	26
1898.....	2,679,048	5288	197	4206	157.0	663	25
1899.....	2,741,470	5221	190	4993	182.2	612	23
1900.....	2,805,346	5199	185	5282	188.5	632	23
1901.....	2,843,927	5033	177	4772	167.7	561	19.5
1902.....	2,883,030	4685	163	4583	159.0	538	18.3
1903.....	2,922,671	4531	155	5190	177.6	527	17.5
1904.....	2,962,857	4874	164	5100	172.0	463	17.5
1905.....	3,003,680	4702	157	5378	179.2	520	17.3
1906.....	3,044,980	4608	150	5377	176.4	477	15.7
1907.....	3,086,687	4771	151	5709	184.9	389	12.6
1908.....	3,129,128	4445	138	5363	171.3	517	16.5
1909.....	3,172,153	4393	133	5635	178.0	390	12.3
1910.....	3,366,416	4503	134	6677	198.4	411	12.2
1911.....	3,444,059	4418	128	5991	173.9	302	8.8
1912.....	3,511,510	4212	120	5965	170.0	269	7.7
1913.....	3,579,000	4180	117	6112	170.7	280	7.8

Year.	Measles		Whooping Cough.		Diphtheria and Croup.		Scarlet Fever.	
	Deaths.	Rate per 100,000.	Deaths.	Rate per 100,000.	Deaths.	Rate per 100,000.	Deaths.	Rate per 100,000.
1895.....	117	4.7	269	10.8	1784	71.0	483	19.3
1896.....	137	5.4	282	11.1	1677	66.0	249	9.8
1897.....	158	6.1	171	6.5	1426	55.0	342	13.1
1898.....	82	3.1	337	12.6	706	26.0	141	5.3
1899.....	241	8.3	338	12.3	1047	38.0	235	8.6
1900.....	330	11.8	337	12.0	1475	53.0	330	11.8
1901.....	173	6.1	210	7.4	1166	41.0	385	13.5
1902.....	333	11.5	337	11.7	873	30.3	313	10.8
1903.....	247	8.4	519	17.8	869	29.7	510	17.5
1904.....	160	5.4	117	3.9	699	23.6	138	4.7
1905.....	177	5.9	218	7.3	652	21.7	117	3.9
1906.....	208	6.8	509	16.7	743	24.4	135	4.4
1907.....	163	5.3	243	7.9	752	24.4	285	9.2
1908.....	331	10.6	288	9.2	747	23.9	369	11.8
1909.....	157	5.0	250	7.9	694	21.9	259	8.2
1910.....	240	7.1	183	5.4	679	20.2	254	7.5
1911.....	158	4.6	292	8.5	563	16.3	184	5.3
1912.....	286	8.2	225	6.4	473	13.5	118	3.4
1913.....	315	8.8	239	6.7	628	17.6	293	8.2

2. Reduction in communicable diseases whose rates have not been materially reduced.

3. Reduction in the rates for infant mortality, cancer, and a number of diseases which are preventable, but not communicable.

The field of preventive medicine is so large

that I will not attempt to discuss all the problems in which your assistance is needed by the State Department of Health.

I will discuss briefly some of the diseases in which great success has already been achieved, and invite your attention also to some problems

which have been more or less neglected or upon which no concerted attack has been made.

Two things influence health officers in selecting the factors in mortality upon which it is best to concentrate their efforts:

1. The number of deaths due to the factor.
2. The possibility of effecting prompt and significant reduction in the death-rate for this factor.

TUBERCULOSIS.

The eradication of tuberculosis depends upon:

1. Acquiring control of the "open" cases and maintaining this control until the death of the patient.
2. In discovering incipient cases and preventing them from becoming "open" cases.

We have in Massachusetts two excellent laws calculated to facilitate control over open cases and the early discovery and efficient treatment of incipient cases.

The law relating to hospitals aims to secure control of tuberculosis cases in the dangerous stages by providing hospital care near their homes. A city or town may comply with this law in one of three ways:—

1. It may build a tuberculosis hospital.
2. It may make satisfactory arrangements with a neighboring hospital to care for its cases.
3. It may combine with one or more communities in building a joint hospital.

If this law is carried out so that the tuberculosis patients in the terminal months of their illness are cared for in hospitals, a further great reduction in the death rate may be expected.

The dispensary law provides that all cities and towns whose population exceeds 10,000 shall provide a proper tuberculosis dispensary, satisfactory to the State Department of Health.

It is unnecessary to make any argument in favor of the properly organized dispensary. Its utility is obvious in detecting incipient cases, in following up cured or arrested cases returned from sanatoria, and in advising and educating tuberculosis patients and their families in the prevention of the spread of the disease.

Both laws should be vigorously enforced, but there is less excuse for delay in the matter of the dispensaries because of the lesser expense involved.

TYPHOID FEVER.

The rates for typhoid fever have been reduced in Massachusetts from 45 in 1887 to 8 in 1912.

This probably means that water and milk have been almost eliminated as factors, and that we are facing the problem of getting rid of "residual" or "contact" typhoid. This is a very difficult task, as it depends upon the education of the individual. If all individuals considered themselves potential carriers of disease and cleansed their hands and finger nails frequently enough, thoroughly enough, and at the proper

times, typhoid fever would disappear from our statistics and become a matter of history.

In this matter of educating the individual in personal hygiene and his duty to his neighbor, the practising physician can be of inestimable value.

I wish to accentuate one other possibility in reducing our typhoid fever rate, viz: anti-typhoid inoculation. This should be encouraged by the practising physician, especially for people who travel much, and patients contemplating vacations. The citizen at home is able to protect himself to some degree, but when travelling is at the mercy of cooks and waiters in hotels, and on boats and trains.

DIPHTHERIA.

The rate for diphtheria has been reduced enormously by the use of antitoxin.

Earlier diagnoses, a broader use of immunizing doses of antitoxin to the contacts, and larger doses to the patient will still further reduce these rates, and these are matters which are in the hands of the practising physician.

SYPHILIS.

Exact knowledge of the prevalence of syphilis is not available but it is known to be widespread. Its effects upon infant mortality, insanity, blindness, tabes and general paresis are well known.

We have exact knowledge, thanks to the laboratory, of its cause, modes of transmission, and prevention.

The story of laboratory achievement in syphilis in the past ten years reads like a fairy tale.

In 1903 Metchnikoff and Roux successfully transmitted syphilis to the lower animals.

In 1905 Schaudinn discovered the cause of the disease, the *treponema pallidum*.

In 1906, Wassermann, Neisser and Bruck gave us the Wassermann reaction, which enables us to detect even those cases without external symptoms.

In 1910, Ehrlich gave to the world salvarsan, a specific destroyer of the *treponema*.

In 1911, Noguchi grew the *treponema pallidum* in pure culture, outside the body, and produced luetin of great diagnostic aid in very obscure cases.

In 1913, Noguchi demonstrated *treponema pallidum* in the brain of patients with general paresis, and in the cord of tabetic patients.

In spite of this exact knowledge of the etiology, prevention and cure of syphilis, we are not able to say that this scourge is being reduced. One glaring defect must be corrected, if only partly. Statistics are lacking and they are no less necessary in this disease than in others, if an intelligent campaign is to be conducted against it. In this the practising physician can be of the greatest assistance. The State Department of Health will make syphilis a reportable disease within a short time. Physicians will report details of

each case, omitting the name of the patient, as is the practice in New York City.

Very valuable information can thus be secured and a definite comprehensive program outlined for reducing the prevalence of this disease.

Because of our lack of statistics of venereal diseases, we are unable to say definitely whether these diseases are increasing or decreasing. I do not believe that anyone is rash enough to say they are decreasing.

I regard the question of syphilis optimistically. We know the cause of the disease and we have specific spirochaeticides. We must have early diagnosis, prompt treatment and treatment with supervision sufficiently prolonged to ensure a real cure. We must cease dallying with dusting powders and iodides in our clinics and make salvarsan and mercury, properly applied, available to all.

The accomplishment of this rests with the practising physician, and the credit for the enormous reduction which will follow in locomotor ataxia, in general paresis, in insanity and in blindness, will also be his.

PNEUMONIA.

The statistics for pneumonia are rather indefinite. We have in our official records bronchopneumonia, lobar pneumonia and pneumonia undefined. In 1912, for instance, there were 5300 deaths under these three headings in Massachusetts, of which 2200, or 41%, were children under ten years of age; about 900 deaths, or 16%, were recorded as lobar pneumonia between twenty and fifty years of age. Another large group includes the deaths in persons between the ages of fifty and eighty.

The first group, children under ten, includes hundreds of cases following whooping cough, measles, and other "benign" diseases of childhood. Too often children with whooping cough are permitted to go to school, ride in street cars and go to theatres and other crowded places.

The pernicious belief that children must have such diseases should be combated and every effort made to protect young children from exposure.

The widespread distribution of pneumococci in healthy individuals suggests that the specific organism requires certain assistance in producing the disease. These other factors in its etiology are not clearly understood, although we may surmise that they act by lowering the natural resisting power of the individual. Prophylaxis is further complicated by the many varieties of pneumococci, and the fact that pneumonia is not a simple problem. We understand little of the mechanism of immunity in pneumonia.

It would seem that normal, healthy individuals have a natural immunity against lobar pneumonia, but that this immunity is rather feeble and easily impaired or destroyed. This

is borne out by the fleeting character of the immunity produced by an acute attack.

For these reasons the development of efficient curative sera and of prophylactic inoculation is not very promising. The laboratory in the future will probably clear up the problem and give us the specifics which we need. In the meantime, cases of pneumonia should be treated as dangerous contagious diseases, the spread of which depends upon the secretions of the mouth and nose.

It seems certain that the natural immunity in normal healthy individuals may be nullified by dissipation, excesses and exposure to cold.

A cold shower and change to dry clothing would prevent many cases of pneumonia in miners, iron and steel workers, firemen, coal passers and many factory and mill workers. As a rule, however, these facilities are not available and the worker leaves the hot atmosphere of his work for the cold outer air in his perspiration-soaked garments.

A great many cases of pneumonia can be prevented by attention to personal hygiene, cold baths, living quarters not above 68° F., and cool sleeping rooms.

As teachers of personal hygiene, we must depend in greatest measure upon the practising physicians.

ORGANIC HEART DISEASE.

Two facts stand out prominently in the consideration of heart disease,—the large part it plays in our death rate and the fact that it is increasing instead of decreasing.

I realize that heart disease is an old acquaintance, but not usually considered a public health problem. Nevertheless, it is not so hopeless as generally believed, and in many cases it is a preventable disease.

Heart disease is not preventable to any great extent by official action, but a great many cases can be prevented by the wise counsel and activity of the practising physician who is thinking of preventive medicine.

Excluding congenital defects, a large percentage of deaths from organic heart disease up to the age of twenty years are preventable. A great many of these are due to what is called "rheumatism." We need more light on the etiology of rheumatism, but we are reasonably certain of the importance of diseased tonsils and pharyngeal tissue in its etiology. We also know the constant association of tonsillitis, rheumatism and damp insanitary housing conditions.

Examinations of school children reach a great many of these cases, but there is no reason why a great many more examinations of young children should not be made by the family physician without waiting for the tonsillitis or the rheumatism or the valvular lesion actually to manifest itself.

Advice should be freely given to prevent the delicate child from overstrain by sudden violent

exercise, without proper preparation, or by entering a vocation for which he is physically unfit.

Physical exercise is of the greatest value if the exercise is properly suited to the patient, but we have seen in Marathon races, entry permitted to ill nourished youths with no preliminary preparation whatever. Exercise these boys need, but certainly not that kind of exercise.

There is a class, however, which is in even greater need of advice than the ill nourished and underfed. It is the overfed man who has no time for exercise, but who works long hours at high pressure, with perhaps heavy responsibilities and many causes for worry. With proper insistence in these cases, many valuable lives could be saved for an additional twenty years of usefulness which are now lost between forty-five and fifty years of age.

CANCER.

Cancer is one of the big factors in our mortality, and like "heart disease," is increasing instead of decreasing.

While our knowledge of its etiology is somewhat obscure, we have enough knowledge, if properly applied, to reduce greatly its ravages.

Cancer is a preventable disease if discovered early and promptly operated upon. There are several reasons why early discovery and prompt action are the exception rather than the rule. The early lesion is painless and we are not looking for it. When it is found, dislike of a cutting operation results in palliatives and delay. In no other disease, perhaps, is procrastination followed by such appalling results.

We should be looking for cancer because when the patient seeks us, it is usually too late. We must look with suspicion upon bleeding piles and uterine hemorrhages, or breast tumors after middle life, or any sore or swelling on the lower lip or tongue.

In addition to acquiring the attitude of looking for cancer and advising immediate action, the physician should seek to prevent cancer by removing one of the contributory causes, namely, local irritation.

Irritation of the tongue from broken teeth or rough pipe stems often occurs, and if warts or moles are subject to irritation they should be removed.

We must not regard lightly gastritis and gastric ulcer. A great many cancers grow from the site of a neglected or imperfectly healed ulcer, and the seriousness of frequent attacks of indigestion should not be minimized.

In an ideal health organization the practising physicians must be considered as health officers. I believe the physician has a moral, if not a legal, obligation to discharge some of the duties of a health officer. He cannot restrict his activity to curative medicine, but must practice preventive medicine also.

In practising preventive medicine, like his brother, the health officer, he must not restrict his activities to communicable diseases alone, but must extend his efforts to the prevention of many diseases which, although not communicable, constitute great public health problems.

The physician's aid to the health department in quick and accurate diagnosis, and prompt reporting of cases is invaluable, but no less valuable assistance may be rendered by the physician as an educator.

I am sure that all practical health officers have found that the greatest defect in the average health organization has been the lack of a medium for carrying sanitary instructions into the home.

It matters little which disease or problem we may be considering, after the officials have eliminated all factors which are corrigible by official action, there remains always a group of factors which can be eliminated only by the enlightened cooperation of the individual families or of the individual members of those families.

Let us consider typhoid fever as an example. It is possible by official activity to install and maintain a safe water supply. It is possible to reduce the danger of infected milk to a minimum by official acts alone. In fact, if the eradication of typhoid fever depended upon the elimination of the water and milk factors alone, typhoid fever could be made to disappear from our statistics with comparative ease.

Unfortunately, after the water and milk factors are eliminated, there remains a group of factors responsible for what is called contact, or residual, typhoid, which is very difficult to reach. The only way these factors, including fingers, food, and flies, can be reached is by instruction in personal and family hygiene.

We do not "catch" typhoid, we "eat" it. That is, it is handed to us with our food or drink.

Transmission of disease by means of fingers and food is the method by which these diseases were perpetuated and handed down from remote ages to the present day. It was the method which perpetuated these diseases under primitive conditions when men lived in caves and huts, and when public water supplies and great milk industries did not exist. And today, whenever conditions approach the primitive, where poverty compels the overcrowding of filthy tenements, we find these factors most active in perpetuating disease.

To secure the instruction of such people, to raise their standard of personal hygiene, is the most difficult problem which today confronts the health officer. It is manifestly impossible for the health officer personally to educate all classes in a community in personal and family hygiene.

Printed literature is of great value, but does not solve the problem, which in most cases demands personal instruction for its solution.

The two most promising agencies for carrying the gospel of public health into the home are practising physicians and visiting nurses. I will not attempt to estimate the relative importance of these two agencies, but I desire to accentuate the opportunity for rendering a great public service which is here presented to the practising physician.

The function and value of the practising physician may be likened to the antibody in the patient's blood which brings the complement into relation with the invading organism. In the blood of a normal individual there is sufficient complement to destroy infection, but without the antibody it cannot reach, combine with, and destroy the infection.

So in a health department. The potentiality to eradicate disease as represented by knowledge of preventive medicine exists, but cannot be applied in the tenement or slum unless some combining influence is available to bring this knowledge into the home in a way that the ignorant can understand.

Let us have an application of the knowledge we possess, and utilize the specific remedies and prophylactics which the laboratory has given us.

Aid the health authorities to secure accurate statistics! Help to prevent epidemics and unnecessary spread of disease by prompt reporting of cases!

Prevent the spread of the diseases popularly supposed to be benign, as whooping cough, measles and influenza, but which are really responsible for hundreds of deaths.

Educate your patients in the necessity of right living. Show them the suicidal effect of overfeeding, lack of exercise, and living in overheated, ill-ventilated rooms. Try to prevent the national fault of running the machine at high speed and under high pressure all the time, without proper relaxation, rest and exercise. Do what you can also to correct another national fault, that of placing a square peg in a round hole. The ill-fed, narrow-chested youth who should be "punching cattle" should not be permitted, without protest, to stoop eight hours daily over an emery wheel.

In asking you to take this extraordinary interest in preventive medicine and hygiene, I am asking you in all probability to curtail your income from the practice of curative medicine. I doubt if such a request could safely be made of any other profession without fear of ridicule, or perhaps personal violence. To your credit be it spoken, I do not think I am in danger of either. I confidently expect that in the future, as in the past, the physicians of Massachusetts will recognize their moral obligation as health officers and teachers of preventive medicine, and continue to aid health officials in reducing death rates in the Commonwealth.

HOSPITAL EFFICIENCY FROM THE STANDPOINT OF THE EFFICIENCY EXPERT.*

BY FRANK B. GILBRETH, PROVIDENCE, R. I.

IN order to describe what an unprejudiced and trained observer in the field of waste elimination thinks of the hospital problem, and what method of attack upon it he would advocate, it is necessary to state what an efficiency expert does, and also to state what hospital efficiency is, from the standpoint of waste elimination.

An "efficiency expert," so called, is simply an engineer who substitutes accurate measurement for personal opinion, judgment, and unscientifically derived conclusions; who has devised units, methods, and devices of measurement that enable him to measure and compare the factors of results of problems that confront him. He comes with no ready made conclusions that are results of theory only, but comes, rather, with measuring means for comparing any performance with its plan. You, whatever your interest in the hospital problem, are primarily scientists. You are interested in facts, and the underlying laws the facts illustrate. All science is based on measurement. You know what we owe to science and measurement. The problem resolves itself into this:—How far has measurement been applied to hospital work, and how far have the results been taken as standards for practice; how can we consider the hospital as a factory; what methods of measuring efficiency in the manufacturing establishment are usable in a hospital?

In considering hospital efficiency, there are two questions which must be asked:—(1) "What does this factory, called a hospital, manufacture; what is the hospital's aim; and how is it attempting to attain this aim?" (2) "Are we getting the product as cheaply, as quickly, and in as large quantities as is possible?"

To consider the hospital in the most general terms, it must be considered as a "happiness factory." The hospital is subject to all the laws and processes of obtaining efficiency in the manufacturing establishment. The output of the hospital is "happiness minutes;" the aim of the hospital is to give the largest number of units of happiness to the most people, with the least expenditure of time, money, and effort,—or, in other words, with the least expenditure of energy possible.

We must think of this product, happiness, (1) as of the happiness of mankind as a whole—of the social group—(2) as of the individuals comprising the group. The happiness of the social group will be best gained when each individual in the group is happy, and when all are working together for the good of all. In the factory, this condition is called "heartiness."

* Abstract of paper read at a meeting of the Suffolk District Medical Society on January 6, 1915.