

Address.

THE USES OF FEAR IN PREVENTIVE MEDICINE.*

BY M. J. ROSENAU, M.D.

Professor of Preventive Medicine and Hygiene, Harvard Medical School, Boston.

It has been well said that the "conquest of fear" is the best indication we have that civilization has really advanced mankind to a higher level.

When we speak of the "conquest of fear" we do not mean that fear itself has entirely disappeared; that can never be. We mean only that much unreasonable fear has been dissipated. I believe that the sum-total of fear has greatly diminished with the progress of the world, but as the amount of fear cannot be weighed or measured, we have no criterion of values.

There is now widespread confidence in the orderly succession of natural laws. People no longer live in daily dread of the spirits of darkness, and are not afraid of the unknown; an eclipse of the sun or the coming of a comet does not strike terror into the hearts of a community.

Epidemics, also, follow natural laws. They come, rise, reach their height and virulence, and decline according to known biological rules. The trained epidemiologist can tell at once by looking at the curve of annual prevalence of typhoid fever of a city whether the people are drinking badly infected water or not. A milk outbreak has its own special characteristics that permit speedy recognition. Certain diseases recur annually with the regularity of our crops. I know of one health officer of one of our large cities who each year takes a mean advantage of the seasonal prevalence of typhoid fever by instituting a newspaper sanitary campaign in September. The health department then claims the credit for the inevitable decline in October.

In fact, the natural history of disease has risen almost to the dignity of a science. In many instances, at least, we are able to control and foretell the phenomena of disease prevalence. For this, of course, we have to thank largely the patient researches into the causes of the communicable infections, and especially the scientific and self-sacrificing studies into their modes of transmission. Useful and trustworthy results have been obtained only by exact laboratory methods. The rapid accumulation of this real knowledge has robbed infection of the superstitious dread in which it was formerly held. We are no longer tied helpless in the face of a devastating plague, and in our ignorance blame it on the supernatural wrath of an irresponsible power. Now we fight back, for we have the knowledge that gives courage and conquers fear.

Whether fear is an instinct or an emotion, we will leave to the psychologist. Such a discussion is aside from our present purpose. Fear is

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largely an involuntary passion, but it may be, in part, controlled by the will-power.

Fear is lessening, but we would not want it to disappear entirely, for while it is a miserable sensation, it has its uses in the same sense that pain may be a marked benefit to the animal economy, and in the same sense that fever is a conservative process. Reasonable fear saves many lives and prevents much sickness. It is one of the greatest forces for good in preventive medicine, as we shall presently see, and at times it is the most useful instrument in the hands of the sanitarian.

One who has not lived through a number of epidemics cannot realize the fearful panic that overtakes a large part of the community when an exotic disease such as cholera or yellow fever is announced. The blanched faces, the hurried whispers, the flight from danger, the disregard for others near and dear, are eloquent witnesses of the terror that has stolen the minds and hearts of strong and weak.

It may seem paradoxical that such a demoralizing passion could have any use, but its benefits are untold. While the first duty of the sanitarian is to check the stampede and speak words of reassurance in order to obtain order and a return to a calmer reason, the wise sanitarian avoids the other extreme of over-confidence. In fact, he prefers the community to have a wholesome regard for the danger of the situation.

If we stop to think about it, we must realize that it is often the fear of a disease that gives the health officer the ways and means to combat it. Because we fear cholera, we have none of it in the length and breadth of these United States; because we have no fear of typhoid fever is why it is endemic, and, like the poor, always with us. The typhoid toll is 35,000 deaths annually in the United States, and there are over 350,000 cases. This is a preventable plague our country does not seem to realize. I emphasize the facts about typhoid because it is disregarded in proportion to its importance. If typhoid were feared as it ought to be, we would soon see it diminish to the vanishing point. The similarity between typhoid and cholera is striking; both are intestinal infections; both occur in epidemics and endemics; both are largely summer diseases; both spread in precisely the same ways; both diseases are about equally dangerous to man, and both should be dealt with alike. A case of cholera in any of our cities to-day would at once be placed *incommunicado*, under the strictest quarantine. The sick room would be screened against flies, the dejecta would be disinfected, the nurse and the doctor would be isolated or they would be required to take most exacting precautions, gallons of germicides would be spilled and fumigants burned galore to proclaim the energy of the sanitary department. The neighborhood would be searched for secondary cases to nip them in the bud. Finally, the convalescents would not be given their liberty until the danger of bacillus carrying had passed. By strange contrast, little attention is paid to a case of typhoid

fever in the neighborhood or even in the same house. Still less regard is ordinarily given to the dangers of typhoid infection on a dairy farm, or in a butcher's shop or bakery, or other places where foodstuffs are handled. Sometimes, to be sure, a sense of false security is obtained by the use of one of the widely advertised but useless germicides, such as Platt's Chlorides. I have found that a whole bottle of Platt's Chlorides, costing fifty cents, may fail to kill the typhoid bacilli in one voiding of urine. This disinfection could be done effectively with 0.2 cent's worth of bichloride, or 0.8 cent's worth of carbolic — good old reliable standbys. But some doctors still prefer to take their science from the attractive type of the advertising pages of the medical journals. I hope that those who take my course will obtain a better understanding of this and other practical matters in preventive medicine and hygiene.

To return to the indifference to disease. I have noticed a nonchalance towards yellow fever in Vera Cruz, Santiago, and other tropical places where "familiarity breeds a species of contempt," and the fatalistic tendency of mankind accepts the inevitable, though a Lazear laid down his life as the result of a mosquito bite to save his fellow-men.

It is the lack of fear of yellow fever that permits it to smolder in an endemic focus, just as the lack of fear of typhoid fever permits it to smolder in Boston, Philadelphia, Washington and other America cities.

A sharp epidemic of typhoid fever is a good life-saver. The fear it instills builds filter plants, spends money and awakens energy for other necessary and expensive sanitary improvements.

Who would put up with the enforcement of a rigid quarantine? Who would tolerate the arbitrary deprivation of liberty if it were not for the fear of disease? Who would for a moment countenance such abominations as lazarettos, leprosaria, the high-handed destruction of property, the paralyzing of trade and restriction to travel were it not for this same dread of disease? Economic arguments appeal to a few; humanity actuates the hearts of many; but of all the motives that incite to action, fear plays a prominent rôle.

It is the fear of tuberculosis rather than the pity of it all that prompts legislatures to build sanatoria and establish clinics and to appropriate large sums of the people's money for the control of this disease of defective civilization. In 1909 \$8,180,621.50 were spent for the prevention of tuberculosis in the United States alone. Of this, \$4,362,750.03 was spent from public money. The remainder was voluntarily contributed.

Modern science has revealed two great facts about tuberculosis. One is a message of hope — that it is curable; the other is a message of fear — that it is communicable. An analysis of the emotions of a community will doubtless disclose the fact that the fear of tuberculosis actuates the present-day progress as much if not more than any other underlying factor. This has gone to such an extreme that some people now have the same unwarranted fear in the presence of this

disease that they have in the contemplation of death.

Though this phthisisphobia is decried and is an unfortunate extreme, nevertheless it must be accounted as one of the powerful levers in the machinery of practical prevention.

In the blind fear of yellow fever, the cities of our southern littoral still pin their faith to antiquated quarantine methods, a procedure of by-gone days, which, in the light of present-day knowledge, has shown itself to be inadequate and illogical. To-day a community cannot afford to isolate itself through quarantine from its commercial neighbors simply because it fears a fever which is readily preventable. Mobile, Galveston, Jacksonville, New Orleans and other cities in the fever zone could readily render themselves fever-proof with comparatively little expense; with an outlay, in fact, that would be small in comparison with the benefits to health and comfort and commerce. All this would be accomplished by exterminating the *stegomyia calopus*. That this can be done in a short time was demonstrated by New Orleans in 1905. If Mobile, for example, would suppress the mosquito, it could open its doors and laugh at yellow fever, just as New York and Philadelphia now disregard a case of typhus fever or relapsing fever, for these cities have, through improved though imperfect sanitation, rendered themselves safe from the spread of these particular diseases which once found favorable soil and good quarry.

Havana has taught us a good lesson. There they are not afraid to take yellow fever patients through the heart of the city to Las Animas Hospital. They apply the knowledge that science has given and find in the mosquito screens efficient protection. Formerly people thought that yellow fever was contagious like smallpox and dreaded contact with patients or with clothing or with other fomites. That that fear has been abolished is well illustrated by an incident that came to my notice during the 1905 epidemic in New Orleans. While working in the Yellow Fever Hospital I happened to be in the corridor when a man with seven children entered. I inquired who was sick. He said, "No one." "Well, why are you here then?" I asked. He answered that yellow fever broke out in the little town in Mississippi where he lived and that his wife was the first to take it, from which she died. He at once bundled up the rest of his family and came straight to New Orleans and directly to the Yellow Fever Hospital, saying that he "reckoned that was the safest place he knew of." He was right. Yet, ten years ago, a yellow-fever hospital would have been the last place in the world in which a man would have sought shelter.

When the fear of fever is transferred to a fear of mosquitoes, there will be no more yellow fever in our seaports. Sensible sanitation will replace obsolete quarantine, one more fear will have been conquered, and a great advance will have been made.

While fear has its uses, it may be sorely overdone. When this happens, it vexes the judicious-

The enthusiasm of intense natures with the proverbial little knowledge supposes that because some germs are bad, all the others must be equally so, or worse. It carries a useful measure to absurd exaggerations and runs the danger of the old proverb, "Care killed the cat." The fact that germs are invisible magnifies the supposed danger to such extremists, who suspect death lurks in every particle of air, food and dust. Pathogenic microbes are not ubiquitous. The constant fear of them is as unreasonable as is the dread of lightning. Such an abnormally developed sense of impending danger is an indication of an unstable and nervous temperament, and must be regarded as pathological. Some people will always be afraid of something, and if it is not the will of the gods or some impending catastrophe, it is such a tiny thing as a microbe. The protection from disease which sanitary science has given us during the last generation is very reassuring and should greatly fortify our "*aes triplex*."

General principles teach the lesson that the occasional introduction of amounts of infection too small to induce disease serves a useful purpose by increasing resistance. All our notions of the production of antitoxins and of acquired immunity are based on the repeated introduction of amounts of the specific virus into the organism too small to cause serious harm. The highest degrees of immunity are induced by living bacteria; lesser degrees are produced by dead bacteria or by the chemical products of their activities. There is, therefore, reason to believe that the chance introduction of a few enfeebled pathogenic bacteria, which may occasionally contaminate our food and drink, may serve a useful purpose in strengthening our resistance.

The lesson to be drawn from these facts seems self-evident. It is not possible, perhaps not always desirable, that our sanitary standards should in practice reach the plane of laboratory perfection. In our ordinary walks of life we cannot surround ourselves with the ideal asepsis reached in the surgical clinic. We must satisfy ourselves with reasonable cleanliness. For drinking purposes we do not need chemically pure water, sterile as that which has been thrice boiled in the test-tube. We do not demand germ-free milk; we only ask for clean, fresh, non-infected milk. There must be a similar compromise between chemical and bacteriological ideals, and reasonable standards applying to our everyday food and drink. We know that a plant raised in a greenhouse with great care cannot withstand the adverse conditions weathered by wild stock. It may be necessary, for similar reasons, to avoid raising a race of "hot-house" men and women.

We cannot live in a "pious vacuum." Clinicians tell us that over-cautious people are especially apt to get typhoid fever. Whether this is so or not, we should satisfy ourselves for the present with those reasonable sanitary standards which science and experience have demonstrated to be sufficient to safeguard us against the communicable diseases.

Even this comforting thought will not, perhaps, dispel the dread some people have of disease. But if such fear has not been conquered, it has, at least, been transferred from an ignorant fear of the disease itself to a reasonable fear of its cause. The former is harmful and the latter has distinct uses.

It was Jenner who empirically diminished the fear of smallpox, but first and last it was Pasteur who fought the enemy at first hand and by determining the cause of fermentation and infection gave the world the physical basis for conquering the fear of disease. Pasteur's work conferred greater material benefit upon mankind than that of any other man who ever lived. One of the results of his labors was to transfer an unreasonable, senseless and superstitious dread of disease itself to a purposeful and useful fear of its cause.

It was Lister who abolished the dread of wound infections; it was Kitasato and Behring who diminished the fear of diphtheria and tetanus; it was our own Theobald Smith who transferred the fear of an important group of diseases to a fear of their intermediate insect hosts.

The other heroes of preventive medicine and their triumphs are too well known to you to need further recounting. But the final conquest will come only when the blind fear of disease itself has given place to an enlightened appreciation of the dangers. This, then, is the fear that preventive medicine uses.

Original Articles.

NON-TUBERCULAR RENAL INFECTIONS.*

BY E. L. KEYES, JR., M.D., NEW YORK.

It is difficult to express in a phrase precisely the group of conditions upon which your committee has requested me to speak this evening. The subject they desire me to discuss is non-tubercular renal infection, leaving apart, as far as possible, infections dependent upon stone or retention as major causes. Such infections vary in clinical type from those in which the patient discovers by accident that his urine is clouded, and resorts to the physician, who finds that he suffers from a mild pyelonephritis without any subjective symptoms, to those in which the inflammation begins in that hyperacute septic form commonly known as multiple septic infarcts of the kidney, but probably better described as focal suppurative nephritis (a term first used by Dr. Farrar Cobb).

In such cases the route of bacterial invasion is from the circulation. We exclude all ascending infections; and here let me protest that this narrowing of the field does not rule out any important class of cases.

The type of ascending renal infection is that due to prostatic retention. In this case, as well as in that of his cousin, or I might perhaps better

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