

CAN EASILY ADD FIFTEEN YEARS TO OUR AVERAGE LIFE

"It is within the power of man," said Pasteur, "to rid himself of every parasitic disease." A wide statement it was, and one that at first carried scant conviction, but we are nearer the goal, he pointed out, than most of us realize. A portion of the report of the National Conservation Commission deals with the subject of national vitality, and shows, by a remarkable collection of facts, that human life is steadily growing longer and could be prolonged much further.

An English scholar who studied the question of the expectation of life 100 years ago remarks that there were "few things less subject to fluctuation than the average duration of life of a multitude of individuals." But since he wrote the duration of life has increased in his country five years for men and six for women. The British Government lost money on a system of selling annuities as far back as 1790, because its calculations were based on old figures and the average duration of life had increased since they had been compiled.

We are living longer than our ancestors—at least the "average man" is. In spite of the adverse conditions that prevail for a large number of the population, we are making headway against the troubles that civilization has brought upon us. And the greatest progress has been made in the countries where medical science is most esteemed and most carefully applied.

There is in connection with the report a table calculated by the most eminent physicians of the country in which it is set forth that of every hundred deaths the forty-two need not have occurred had the proper preventive measures been taken early enough. Of the illnesses of middle life over half that now terminate fatally need not have had any such ending.

If these preventable 42 per cent. of deaths were really prevented and the gain distributed, it would be found that the average life had been lengthened fifteen years. These years could be added by the application of medical science as it is today. The estimate makes no allowance for discoveries that almost inevitably must come soon or for the application to everybody of the hygienic laws known to-day. Our "incurable" diseases may well become simple problems before many years and thus add another stretch to the growing length of human life.

Even this is not all. We know that we may fight against illness, we know that right living will keep us well, but the "law of nature" that man should begin to age and become useless after he has reached 80 years or so we have thought inexorable. But the science says that old age is in itself a sort of disease, and may be pushed back far beyond its present limits.

The loss, from a money standpoint, every year, through preventable deaths and sickness amounts in the United States to nearly three billion dollars. Of this enormous sum two-thirds need never have been spent—the trouble was entirely preventable.

Mr. Irving Fisher, Professor of Political Economy in Yale University, is the author of that part of the Commission's report which deals with the conservation of national vitality. He gives the rate of the lengthening of life throughout the world in the following table:

Country—Periods.	Males	Females
England, 1871-1881 to 1891-1900	20 yrs. 14	20 yrs. 16
France, 1871-1881 to 1891-1900	20 yrs. 20	20 yrs. 22
Denmark, 1835-1844 to 1895-1900	27 yrs. 13	27 yrs. 15
Sweden, 1816-1840 to 1891-1900	27 yrs. 17	27 yrs. 19
Massachusetts, 1780 to 1826, or 66 years	11	11
Massachusetts, 1827 to 1893-1897, or 70 yrs.	14	14
India, 1881-1901, or 20 years	7	7

Prussia, the home of progressive applied medical science, heads the list, while India is the example of what happens when science is kept out altogether. "This country makes a good showing, with fourteen years added to life during four decades, but of course Massachusetts may not be typical of the country as a whole. We have no good vital statistics, as yet, for the entire nation.

Geneva has records that show the average span of life over three centuries. It has gone this way:

Sixteenth century	21.0
Seventeenth century	23.7
Eighteenth century	26.6
1801-1850	28.7

These are some of the startling facts collected in the report on National Vitality. It is not often that a Government publication bearing the subtitle of "Senate document No. 676, Sixtieth Congress," etc., is as thrilling as a novel, but Prof. Fisher has certainly managed to make his section of the work most enthralling.

Taking it up in detail we find first the figures which show how long people live in different parts of the world. If you wish to be as sure as possible to reach middle age you stand a better chance by getting yourself born in Sweden than anywhere else—though Prussia is catching up very fast. And of course you will not in any country commit the mistake of being born a man. Women have distinctly the advantage over men in the matter of clinging to existence everywhere, even a little in India, where everybody seems to die because there is no special reason for it.

Here is a table of the modern duration of life in different countries. The United States has to be represented, as before, by Massachusetts, and absolute accuracy is not claimed for any set of figures, but they are near enough for purposes of comparison:

Country	Males	Females
Sweden, 1891-1900	50.9	53.6
Denmark, 1898-1900	48.7	49.1
France, 1888-1900	45.7	47.7
England and Wales, 1891-1900	44.1	47.7
United States, 1893-1907	44.1	46.6
India, 1899-1900	22.0	24.0
Prussia, 1881-1900	41.0	41.5
India, 1901	23.0	24.0

It is evident, from this table, which shows the average duration of life in India to be scarcely more than one-half that of France and less than one-half that of Sweden, that "the length of human life is dependent on definite conditions and can be increased or diminished by a modification of these conditions."

Taking the death rates of various cities and allowing for the probable inaccuracy of some of the work, and particular factors, like emigration, there is still left evidence of what municipal vigilance and the good habits of the people can do toward reducing mortality. Dublin, for instance, has a death rate of 33.9 per 1,000 population, and Frankfurt-on-the-Main has but 15.6. New Haven has a lower death rate than either Hartford or New London, its near neighbors, although it is a larger city. And Cleveland, Ohio, had a death rate of only 16 to Cincinnati's 20.8.

Naturally, if one wishes to live long, one must be born rich. Not all centu-

Prof. Irving Fisher, in a Comprehensive Report on National Vitality, Says What is Needed is a Little Care—Life Already Greatly Lengthened in Every Country Where Medical Science is Applied.

narians have been rich men, but as a class the well-to-do have a tremendous advantage over the poor. In Paris, two rich quarters had a death rate of 13 and 16 while a poor quarter which was taken in comparison has a rate of 31—about twice as high.

"That a well-to-do class, properly fed and clothed and with opportunity for leisure, will be less susceptible to disease and death than a poverty-stricken class, ill-fed and overworked, has been repeatedly shown by statistics. Newsholme has stated, for example, that in Glasgow the death rate among tenants of large houses is much lower than among the tenants of smaller dwellings."

The death rate in the registration States of this country according to occupations is given roughly as follows: Mercantile and trading classes, 12.1 per 1,000; clerical and official, 13.5; professional, 15.3; laboring and servants, 20.2. The death rate in special trades, those that require the worker to live in an atmosphere of dust and those in which poisons are used, is, of course, very high indeed.

It is apparent, then, that length of life varies greatly and depends on environment. It is not written in the stars that men shall die at such and such an age. By studying the conditions under which men live longest and best certain cities have reduced the death rate in a fashion nothing short of marvellous.

In twenty-five years it fell in Berlin from 33 per 1,000 to 16; in Munich from 41 to 18; in Washington from 28 to 19. In sixteen years ending 1903 New York lowered her rate from 25.4 per 1,000 to 18.6. All over the registration area of the United States the mortality has been lowered. As for Havana, where the records run back over a century, the last 100 years has seen the death rate reduced from 54 per 1,000 to one varying between 20.4 and 33.6.

Now comes the question, how have these lives been saved? Obviously some diseases ravage humanity less than formerly, but which? It is true that the saving in life has come largely in the reduction of infant mortality.

When a child is born to-day he has a much better chance of reaching maturity than his great-grandfather had, but should he attain the age of 90 he is not any better off, so far as expectation of life goes, than that worthy gentleman was. The reason for this is that while general conditions have improved, while epidemics are rarer and briefer, certain diseases have increased in modern times.

The death rates from diabetes, heart disease, Bright's disease, are nearly double what they were thirty years ago. Cancer is probably on the increase, and other like parasitic disorders of the liver, and "all manner of degeneration" are apparently tending to increase.

What has reduced the death rate and what will further reduce it is the application of medical science to the great, common diseases that carry off most of the people who die in this country. Take tuberculosis, for instance. The death rate

from that disease is equal to the combined rate death from smallpox, typhoid fever, diphtheria, cancer, diabetes, appendicitis and meningitis. The rate in 1907 was 183 for 100,000 population.

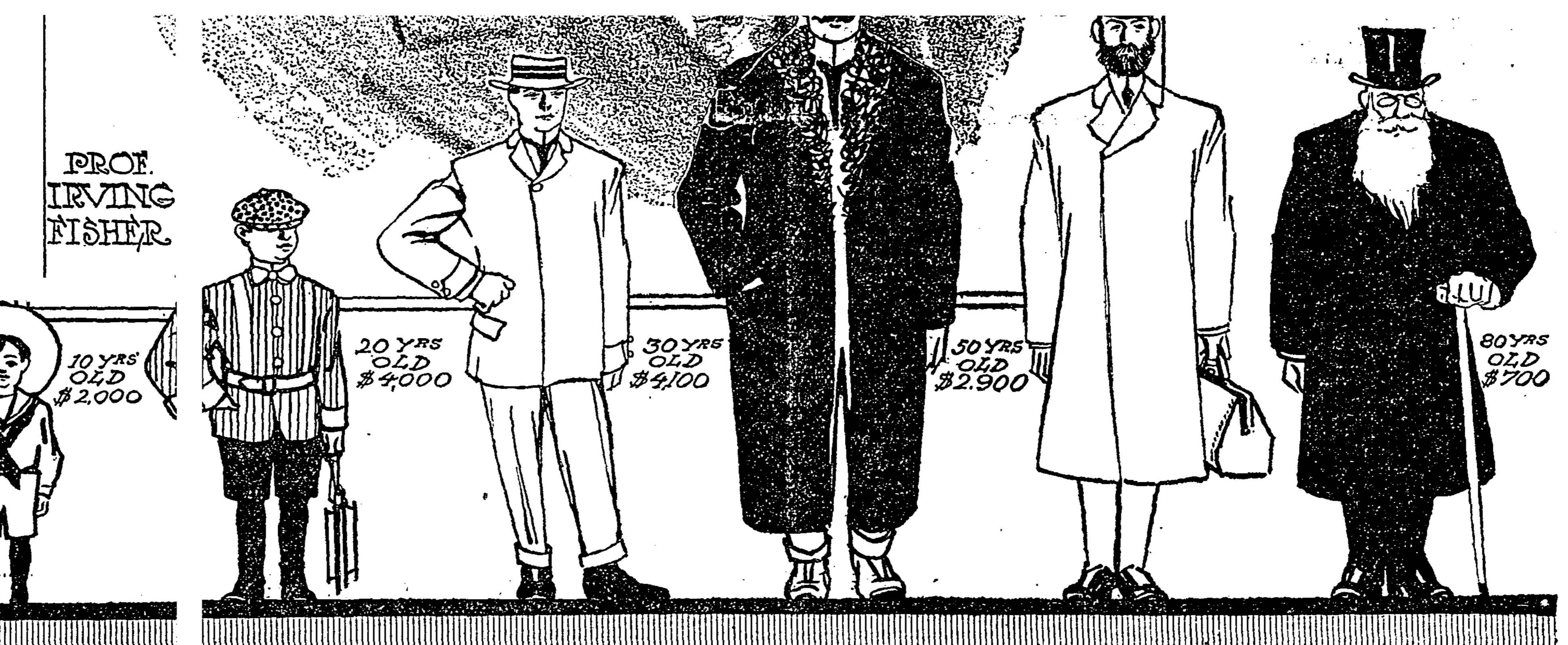
Now tuberculosis is a perfectly preventable disease. Already it has been curbed a little, and with sufficient money and good housing laws there is no reason why it should not be almost stamped out. Under ideal conditions 99 per cent. of the cases would not occur, but without counting on the possibility of our attaining Utopia, the physicians who have made out a table of preventable diseases think that 75 per cent. of the cases need never have occurred.

Pneumonia is responsible for 11 per cent. of all deaths. Pneumonia is a communicable disease, and can therefore be prevented to a great extent. People "in condition" are not apt to have it. No doubt this large death rate will shortly be reduced sixty per cent. of its deaths are preventable. Typhoid fever is yielding to preventive measures in a most striking way. In ten years it fell from 46 per 100,000 population to 33, and it is steadily growing less. In German

cities it has been almost stamped out. "The relation of the fly to typhoid is now understood, and the extermination of the little pests will further help matters."

Of course smallpox and yellow fever are hardly reckoned with any longer. During the eighteenth century, it is computed, over 50,000,000 persons in Europe died of smallpox. This fearful waste of life has been stopped—just as we shall stop tuberculosis one of these days—and the result was a great lengthening of the average duration of life.

The physicians who have drawn up the table of preventable deaths have taken the ninety most common causes of man's taking off. They show that some of the ordinary diseases might be practically done away with even now, while others, Peritonitis, for instance, is a trouble for which little can be done. It comes or it doesn't. Cancer is marked zero for preventability. But no doubt some discovery will be made that will take cancer out of the unpreventable class, just as it will happen with the other diseases marked nearly or quite zero. The commonest illnesses, like tuberculosis and pneumonia,



This Diagram Shows the Net Worth of a Person in Dollars at Different Ages, Thirty and Thereabout Being the Highest Points.

are, of course, known to be easily preventable. But the conservation of national vitality does not depend only on the preventability of deaths. What shall it profit a man if he be kept alive, provided he has no joy in life? It is an old, but ever true, jest which says: "Is life worth living? It depends on the liver." So it was in line for the report to take up the question of sickness.

For every person who dies during the year there are two persons constantly ill during that year—that is, every year about 1,500,000 persons in this country die. And this means that at all times there are about 8,000,000 persons seriously ill. This is an average of thirteen days illness each year for everybody.

A large part of the population, therefore, is always incapacitated for work. "It is estimated that there are half a million persons constantly suffering from tuberculosis in this country. It is safe to say that half of these cannot work, while the other half can do but half a well person's labor."

There is the famous hookworm in the South, and malaria and social diseases,

all preventable. There is, too, an appalling list of workmen injured in the course of their occupations. Of the 29,000,000 workmen in the United States over half a million are annually injured or crippled—that is, more men than were killed or wounded during the Russo-Japanese War. "More than half this waste is needless."

People have got to keep well if the national health is to be conserved. It is all very fine to be cured after you have contracted typhoid, but obviously the main thing is not to get it at all. For every death from typhoid there are eight cases of illness, averaging seventy-five days of incapacity apiece. The death rate does not begin to tell all the tale.

What Prof. Fisher dwells on is the necessity for keeping one's self rid of "minor ailments," if life is to be prolonged. Centenarians, says Prof. Fisher, "are usually persons who have been exceptionally free from illness and who have performed a large amount of work. This work is usually physical labor out of doors, although the few mental workers completing the century have also lived busy lives."

We lose an amazing amount of time

from minor ailments. The estimate is that every "well man" loses five days' work a year on account of headaches, toothaches, colds and similar ills, which do not keep him from saying, quite truthfully, according to popular opinion, that he "hasn't had a sickness that year."

Nine-tenths of these minor ailments could be avoided. We all know about bad air and rich food and exercise and so forth, but we don't apply what we know, and then after years of persistent neglect of hygienic rules we up and die of "pneumonia."

Then again the question arises "What is a 'well' man?" When we use the phrase we usually mean a man who is free from illness great or small. But is not a man who has run twenty-five miles without stopping or climbed the Matterhorn without fatigue more "well" than a person "in good health" who cannot walk upstairs without losing breath?

Naturally, he is. "That the world should regard such performances as 'marvelous feats of endurance' only shows how marvelously out of training the world as a whole is. What we suffer from is 'undue fatigue.'"

With this preliminary Prof. Fisher proceeds to demolish the drinking, smoking, and drug habits of mankind. He does not believe in the virtues of any stimulant though used in the strictest moderation, and he believes they are the occasion of much undue fatigue. He marshals a great many facts and statements to support this conviction.

He thinks, however, that "auto-intoxication is not only an exceedingly common affection but also the chief cause of undue fatigue." He speaks a kindly word for vegetarianism, though it is admitted that the subject has as yet received little scientific attention.

Perhaps the portion of this pamphlet which will strike the most responsive chord in the breasts of the majority of readers is that in which the ills of overwork are set forth. On this point Prof. Fisher is very emphatic.

"The striking working day," he says, "is a striking example of the failure to conserve national vitality. In order to keep power unimpaired, the working day should be physiological, that is, it should be such as would enable the average individual to completely recuperate over night. Otherwise, instead of a simple daily cycle, there is a progressive de-

terioration. A reduction in the length of the working day would be the chief means of improving the vitality of workmen as well as the worth of life to them."

There is an "economic waste" from undue fatigue, which Prof. Fisher estimates to be "much greater than the waste from serious illness." The average time lost each year through serious illness is about two weeks. "On the other hand, the number that suffer partial disability through undue fatigue certainly constitute the great majority of the population. No observer can fail to conclude that this is true of the American working, business and professional classes, and the latest word among the students of school hygiene is that it is true to a large extent even among school children."

Prof. Fisher estimates that we may safely say 50 per cent. of the population are impaired to the extent of 10 per cent. of their working powers. And the evil thing about this is that the overfatigue leads to minor ailments and the minor ailments to serious ones, and they lead to the graveyard. So it is all of a piece. A typical succession of events is first fatigue, then colds, then tuberculosis, then

death. "Prevention to be effective must begin at the beginning."

The chain has been followed a long way. First, to live to a good old age we must not have serious illnesses, then to avoid serious illnesses we must not have minor ones which lead to them, and to avoid minor ailments we must have a good physique kept in proper repair and not overworked.

The next step is to see that all children are born with the possibility of attaining health. That means that the unfit, the imbecile, and the insane should not rear families. In some States there are already severe laws on this subject, notably in Indiana.

Eugenics, which has Prof. Fisher's earnest support, would prevent the marriage of the unfit, and would hope by the weight of public opinion to make marriages which are likely to turn out badly, as regards the health of offspring, uncommon and unpopular. The marriage of brother and sister is now unthinkable. This has come about by the application of the eugenics idea—they were eugenics without knowing it. Similarly, by cultivation, healthy ideals of marriage will appear more and more, inspired by the determination that the next generation shall have a chance to be healthy and happy.

Prof. Fisher would see the national vitality conserved through a consideration of public regulation in matters of hygiene. The municipality, the State, and the Nation would all share in the task. Hours of labor would be regulated, especially for women, and among women more especially for mothers; children would not work under these regulations, and there could not be, as there are in New York City to-day, 800,000 rooms without a window.

Critics arise every once in a while and observe that while it is all very well from the sentimental standpoint to save the lives of weakly infants, it is a poor way of serving humanity. In the long run we would be better off, say these folks, if the weakly were left to die, as nature meant them to. Prof. Fisher is quite prepared to meet these objections.

"It is pointed out that the mortality later in life has not decreased, and that in some cases it has even tended to increase. But this fact can be explained in either of two ways. One is on the hypothesis of the extension of the lives of weak infants. The other is on the hypothesis of the comparative neglect of hygiene among adults. It is surprising that this latter alternative has not been given due consideration."

Prof. Fisher points out that some children less ideal than others were left to die, while the parents, who thus keep the young feet in the way they should go, stray from it themselves in the most obvious manner. The point is that these new hygienic ideas did not belong to the last generation. The adults of to-day were not trained in them. They can't teach their own children, but they can't learn the new tricks themselves.

In answering the argument about the preservation of weak children, Prof. Fisher says some very telling things. "It is commonly overlooked," he remarks, "that the same causes which prolong the weak lives also prolong the lives of the strong, and, reversely, that unhygienic conditions which tend to exterminate the weak tend also to shorten the lives of the strong. Bad hygiene is a common handicap for all classes. The weeding-out process, whether there is a great or a small obstruction."

Further, where there is a high infant mortality there is also a high adult mortality. The "unfit" are not weeded out to leave only those who can successfully cope with the bad conditions. Unhygienic surroundings mean a constant fight, and a constant succession of failures, first the weak, but eventually the strong also.

When all these preventive measures have been applied, when eugenics shall have taught the world how to conserve the next generations when there shall be an honest effort to make people happy and well, even if there isn't quite so much money made, there will be a chance for civilization to show what it can really do. Nowadays a scientist is cut off in the height of his usefulness. In days to come he will be pursuing his discoveries for years past the age at which most men now die. Stores of knowledge will not be accumulated just to be lost when they are most precious.

Each child born into the world costs money up to the age when he begins to be a producer. Some one has made the calculation that he costs nearly one thousand dollars. By the death of young people there is an actual money loss to society. By prolonging life we increase the wealth of the world; "it costs no more to 'raise' a man capable of living for eighty years than it does to 'grow' one who has not the capacity of living to be forty years old."

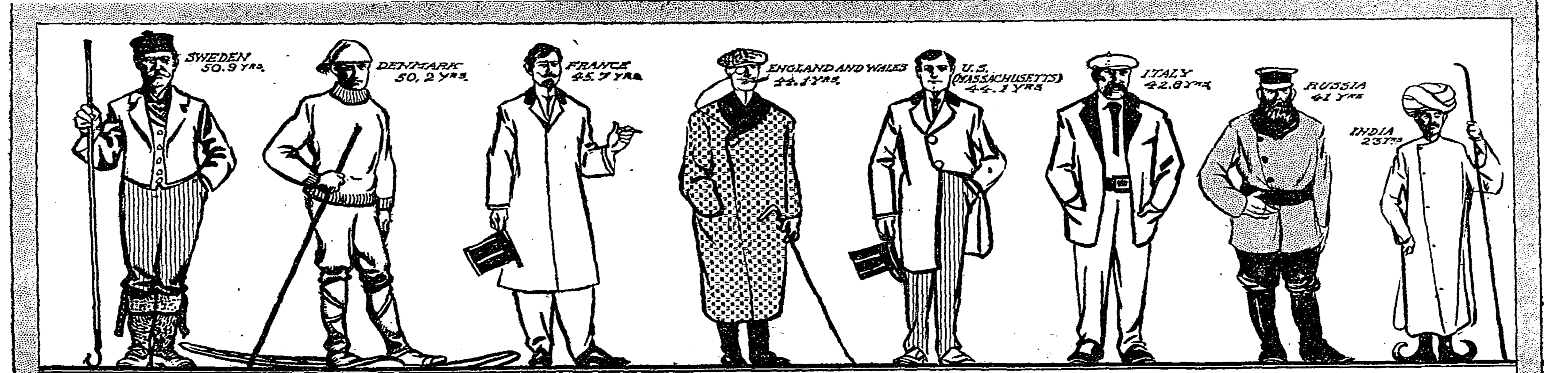
The net worth of a person has been calculated—like most other things—in dollars. Of course one has to live right through life in order to "make good," but if you do this is what you are worth, if you're the "average man," in dollars, as a National asset:

Age	Worth
0	\$90
5	\$950
10	\$2,000
20	\$4,000
30	\$4,100
40	\$2,900
50	\$2,900
60	\$2,900
80	\$700

If 42 per cent. of the deaths in this country might be postponed and each postponement would save the country, it has been estimated, \$1,700, the national annual unnecessary loss of capitalized net earnings is about \$1,000,000,000.

These are the deaths. But remember that for every person who dies there are two seriously ill. There are always 3,000,000 persons on the sick list in the United States. They lose, calculating their earnings at the lowest, \$500,000,000 annually in wages. It begins to look as if it might be cheaper to prevent disease, so far as it is preventable, than to stand this constant loss.

What would life be like if everybody was always well? Can such a state of affairs be imagined—everybody good-tempered, everybody full of vigor, everybody ready to do a kindness, yet everybody full of fight and fun, too—just as people are on some gorgeous days when they have the thrill of perfect health. There isn't any particular reason why this shouldn't come about pretty soon, as soon as human life is valued above money and we let the doctors do what they all want to do more than anything else—keep us well, instead of making us well after we've got ourselves into trouble, merely conserving the national vitality instead of mercifully patching it up from time to time.



Comparative Diagram Showing Average Duration of Life in Different Countries. In Sweden and Denmark the Average Life is Longest. In England and the United States, with Massachusetts as a Basis, the Average is the Same, and It is the Lowest in India.