

JOHN HARVEY KELLOGG (1852-1943)

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LONGEVITY

One Hundred and One Years Old—

AND STILL "GOING STRONG"

Written for "Good Health" by

G. W. LEFFINGWELL, Ph.D.

AMASA CLARK, veteran of five wars and oldest living member of the Veterans of Foreign Wars of the United States, first citizen of Bandera, Texas, serenely looks back upon a span of more than one hundred years.

Born on September 3, 1825, he is still "going strong" after rounding the century mark of an eventful life which has witnessed the greatest changes the world has known. Mexican War days, the strenuous periods of pioneering in Southwest Texas and the settlement of the hill country, the battles of the sixties, fill the pages of his years. The passing of time has not dimmed his memory, and on occasion he can relate incident after incident of spectacular days in conflict on foreign soil and the none the less stirring weeks and months in the wilderness which later became his home.

Mr. Clark works regularly each day upon the prosperous pear farm which he owns about four miles from Bandera. It is to this daily active toil out-of-doors that he attributes in large measure his long life. "Life in the open promotes health," said Mr. Clark as he paused in his work of digging up some dead trees in the orchard on his farm to give the recipe of his longevity.

Erect and alert, bright-eyed and ruddy with the glow of daily exercise in the open air, Mr. Clark looks far from his one hundred and one years. He held himself with something of the unconscious military straightness of the soldier as he talked.

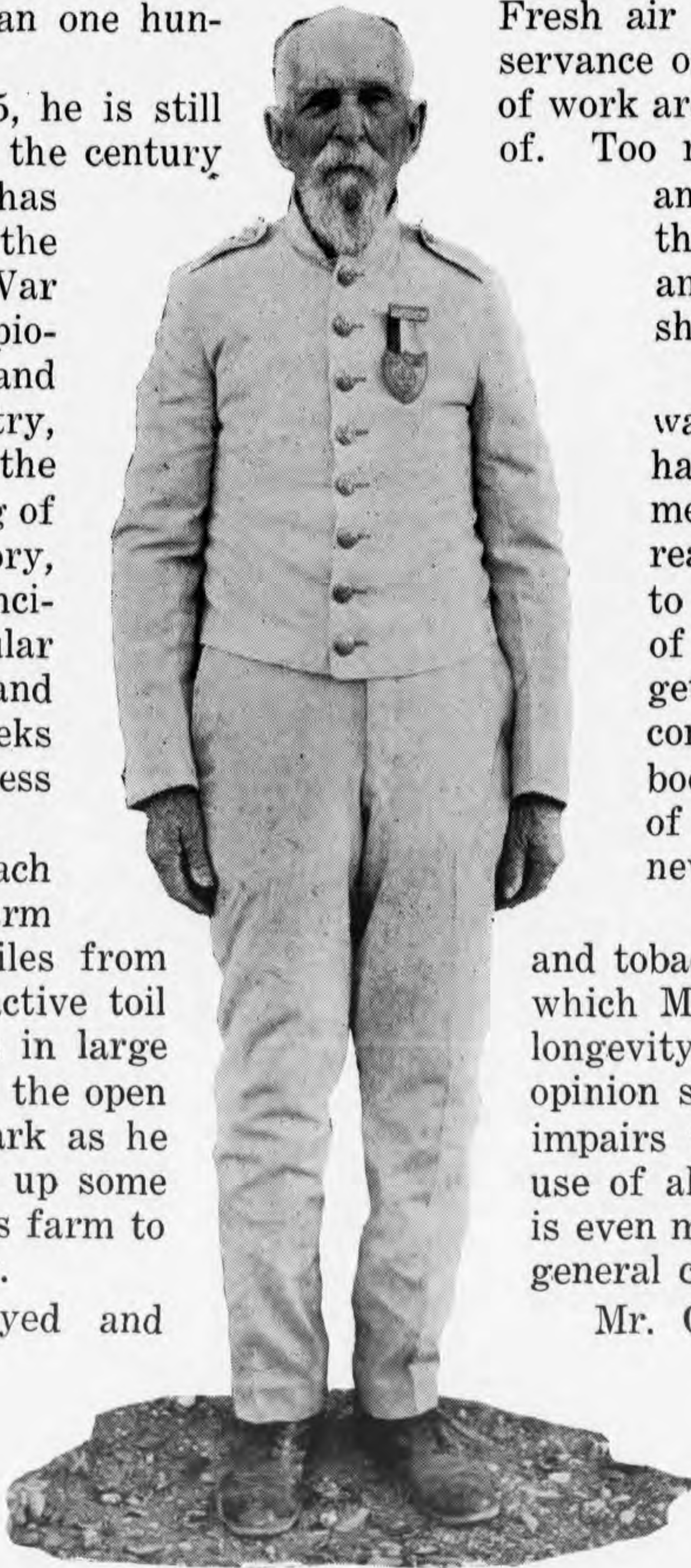
"A rational natural method of living with plenty of exercise causes healthy fatigue which induces sound and restful sleep. It builds up the appetite and stimulates our vitality. Fresh air and sunlight, an intelligent observance of the laws of nature, and plenty of work are the best health-builders I know of. Too many people coddle themselves, and instead of being good for them, it only makes them delicate and less able to withstand hardship or disease.

"I have always been fond of walking. I guess all the 'hiking' I had to do in my soldier days gave me the habit. And exercise is really a habit and one that's hard to break. Just once get the habit of it and the more exercise you get, the more you want. Of course common sense should be used. Nobody should overdo to the point of exhaustion, and I am careful never to let myself get overtired."

Total abstinence from liquor and tobacco is the second vital factor to which Mr. Clark attributes his unusual longevity and splendid health. In his opinion smoking weakens the lungs and impairs the general vitality, while the use of alcoholic stimulants in any form is even more harmful in its effect on the general constitution.

Mr. Clark's appetite is good—Mrs.

Clark is witness to that—and he is always on time for breakfast, which is served at an early hour, and at other meals. All the meals are of simple farm fare with plenty of fresh fruit and vegetables.



Amasa Clark, oldest living member of the Veterans of Foreign Wars wearing the United States uniform of the Mexican War, 1847-48

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Sinclair's "Code of Health, 1844"

p. 23

"Hippocrates of old observed that the Phasians were tall, soft, bloated and pale, on account of the excessive moisture of the air they breathed, their country being marshy, hot, watery, woody, and subject to violent showers, at all seasons."

"The gains of science and democracy have been enormous. Nevertheless, we are discontented and unsettled, deeply disappointed with the results of so much intelligent labor. We even look with a kind of envy at the naked savage, living a simple life in the primitive forest. He at least knows how to behave, and has little to regret. This is not mere meaningless sentiment, it is actually a fact that the average man is less accurately adjusted to his environment than most wild animals. We have created an enormously complex machinery which we do not know how to operate quite successfully."--Prof. Cockerell,

p. 14, Natural History Magazine, Jan., 1920.

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Sinclair's "Code of Health" , 1844, Sixth Edition.

p. 16, Appendix.

"Lord Bacon justly calls the stomach 'the father of the family',
for if it goes wrong, the whole body suffers. It is the principal and the
most important organ for the restoration of our nature."

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"Bacon's health was always delicate. He speaks of himself as 'a man of no great share of health, who must therefore lose much time.' His nervous system seems to have been exceedingly sensitive and he swooned upon slightest cause. By careful management of his health by the admirable rules he laid down for others, he survived the storms of his political career and his friends expected for him a good old age. In his sixty-ninth year, when driving in London, he suddenly hit upon the notion of using snow as a preservative. He stopped his carriage, purchased a fowl and with his own hands stuffed it with snow. He was seized with a sudden chill, the cold and chill were succeeded with bronchitis, and he died within a few days. Bacon, like Kant, deserves to be remembered as one who lived his philosophy and who with small resource of vital energy kept that at its best and so made the most of the marvelously fine thinking machinery with which he was endowed."

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"Lord Bacon seems to have been the first who, by a careful and minute inquiry into the duration of the lives, both of man and of a number of different animals, established the principle that longevity is in proportion to the slowness with which the animal reached maturity. This, indeed, is the case in the vegetable as well as the animal kingdom. It is a sign, he observes, that nature finishes her periods in larger circles.

"It is owing to this circumstance that people in cold countries and whose growth is not accelerated by enriching food, or early debauchery, live much longer than the natives of warm countries, who are reared as it were, in a hot-bed and who are full-grown men and women at twelve years of age."

Sinclair's "Code of Health", (1844) Sixth Edition.

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p. 14, Appendix

"Buffon remarks that 'children brought up in the country, or whose parents are poor, require two or three years longer to arrive at puberty than the children of more opulent parents, because their food is not only bad, but given too sparingly. This very circumstance, however, by checking too rapid growth, may be of service to them, or at least may promote their longevity."

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p. 14, Appendix

"The most extraordinary instance of early maturity recorded in history, is that of Louis the Second, King of Hungary, who, it is said, was born so long before the natural time, that he had no skin; in his second year he was crowned; in his tenth year he succeeded; in his fourteenth year he had a complete beard; in his fifteenth he married; in his eighteenth he had grey hairs, and in his twentieth he died."

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"According to Buffon, though man arrives at his highest stature when he reaches his sixteenth or eighteenth year, yet his body is not completely unfolded, in regard to size, before he has attained thirty. A man, therefore, who grows till thirty, ought to live till ninety or a hundred. or three times the period of his growth.

"Lord Bacon, on the other hand, considers it to be a rule of nature that animals, in general, should live eight times the number of years which is requisite to the attainment of their perfect growth; and on this idea, as man attains to full maturity at twenty years, his life ought to be extended to one hundred and sixty years."

"But Buffon justly remarks,*that persons of either sex, who are slow of arriving at their full growth, should outlive those who advance more rapidly to that point; because in the latter case, the bones, cartilages, and fibres, are later in arriving at that degree of rigidity which precedes their destruction."

*"Buffon, Vol. 2, p. 478. The following circumstance tends to prove the dangers of premature growth. The celebrated Berkeley, Bishop of Cloyne, took a strange fancy to know, whether it was not in the power of art to increase the human stature; and an unhappy orphan called Magrath, appeared to him a fit subject for the experiment. It is not said what process he pursued for the purpose, but it is certain that the youth became seven feet high in his sixteenth year. He was carried through various parts of Europe for the last years of his life, and exhibited as the prodigious Irish Giant. But so disproportioned were his organs, that he contracted an universal imbecility both of body and mind, and died of old age at twenty. See Watkinson's Philosophical Survey of Ireland, one volume octavo, printed at London, anno 1770, p. 187."

"A man may die old at thirty, and young at fourscore:
nay, the one lives after death, and the other perished before
death." - Seneca.

To be seventy years young is sometimes far
more cheerful and hopeful than to be forty years
old.—*O. W. Holmes*.

not should be of absorbing interest to all in-
sirs of keeping the peace. For some rea-
thinking about peace has been confined to the
causes of war. The causes of peace have been
largely neglected. The analogy from medical
science is instructive. The doctors are interested
in the causes of disease, but they are also inter-
ested in the causes of immunity to disease. The
present Anglo-American immunity to the war
fever is so striking a phenomenon that it deserves
the careful analysis of peace loving men the
world over.

THE VALOR OF OLD AGE.

There is a familiar irony in the willingness of
youth to take perilous risks and the unwillingness
of age to take any risk at all. Youth in this
view is valorous, old age timorous, youth gal-
lantly ready to throw life away when its ex-
pectancy is greatest, age jealously guarding the
meager remnants remaining. There is no mystery
in the contrast, but there is some misunderstand-
ing of the situation. It is not only that youth's
willingness to stake life has considerable support
from youth's necessary inability to value its
riches. But there is more in the matter than
that. There is a valor of old age as well as a
valor of youth, and it is a finer thing than its
shining forerunner. It is harder to be brave
when the battle turns against you, when the
sword arm wearies, the blows of fortune ache,
and hopes of the laurel wither one by one.

Age is a long and unremitting struggle against
the inevitable and incorrigible offensive of time.
There are few of us that can very heartily echo
Ben Ezra: "Grow old along with me, the best is
yet to be, the last of life for which the first was
planned." There is an irreconcilable magic in
youth which dulls the buffets of experience, keeps
a glow alive in disillusionment, and an uncon-
querable hope through disappointment. Age fights
with no such glorious reserves at its shoulder,
and to cast up the account in candor only reveals
how few are its compensations. There are off-
sets, but it is wiser not to strike the balance. Age
fights on grimly against the tide and its courage
is greater than youth's.

Chicago Tribune, May 26/20

Editorial of the Day

KANSAS AND THE CIVILIZED WORLD.

[Atchison (Kas.) Globe.]

Washington, D. C., has discovered that Sen-

Allen of Kansas is well dressed.

"toned" society maga-

coaches sar-

There dawns no hope
The very air
Breathes out a prayer
As sacred as a mother
If as I feel,
I'd act, I'd kneel—
My father was a soldier

How strange the world
The nation's night
Fades in the light
Of our resplendent
Eternal shame
On our fair fame
If we despise our blood

It seems not long ago
His regiment,
All hearts intent,
Marched, colors flying
Scarcely an eye
From tears was closed
He never asked if

O boys! is not the
Is not "Old Glory"
Have patriot hearts
Is freedom's breath
Are Shiloh, Henry,
Antietam, Vicksburg
Mere names expressed
Are they not rather
Is Lookout mountain
An idle fancy like
Is Gettysburg's day
The vision of a soldier
No, boys, the wither
The scar, the crucifix
The empty sleeve
The memories that

Beneath unnumbered
Like sleeping comrades
Yon hero dead in
Our coming, be
We'll strew the
Fresh springing
Our country's flag
We'll plant, till

O boys, 'tis naught
Long as I live
This day I'll
To service for
My father was

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"Mr. Watts was eighty-six years old, but although so advanced in years he carried himself erect, we are told, and his eyesight was undimmed. 'He used no glasses, walked without a stick, and until the last three or four years he was known as one of the best riders in Surrey.' As Mr. Watts rose with the sun he went to bed with it -- 'at least in summer time, when he was often up and at work with his pictures or his statues as early as half-past three o'clock in the morning.'

"When asked what was the secret of his extraordinary longevity, or unabated vitality, Mr. Watts made the paradoxical reply, 'I have always been very sickly.'

"'From my earliest years,' he went on to say, 'I have never been robust; and indeed for this reason I was compelled to refrain from most of the violent exercises of youth. I neither drank, nor smoked, nor did anything, in fact. I am a very negative sort of person. I have just lived--with the exception, of course, of my work. But although I have been successful, far beyond anything I ever hoped when I began life, I cannot say that the joy of life has ever been mine.'

Our Outsides - Page 117
(Ferne)

Stephen Smith

Look up first
name

R. F. Watts?

over

"The first duty of the religious man, Mr. Watts held to be 'to live a healthy life, to have the body in which your soul lives in good working order. How many generations have lived, and died in the belief that piety consists in the maceration of the body; and in spending many hours upon their knees crying to God to do this, that, and the other for them! Instead, how much better it would have been if they had looked after their own health, and looked after their neighbours'! In the long run the body avenges itself upon the soul which neglects, or abuses its habitation. Being naturally sickly, I had orders to take care of my body. I have never smoked. Greater things were done in the world, immeasurably greater, before tobacco was discovered than have ever been done since. The cigarette is the handmaid of idleness.'"

"Tobacco wick, tobacco wick!
When you're well 'twill make you sick;
Tobacco wick, tobacco wick!
'Twill make you well when you are sick."

Tobacco was formerly held in great esteem as a medicine. It is a remarkable fact that Shakespeare (whose general knowledge was so widespread) does not mention tobacco, even indirectly, in any of his writings.

said Goethe,

"The being who lives unnaturally must meet early destruction," ~~says~~
 Goethe; ^{and} in his work on longevity, the French philosopher, Flourens,
 declares that 'in the luxurious and perverted mode of life common to
 this present age, man does not die, but kills himself.' Alas! it must be
 admitted with Schopenhauer, 'Man no longer comprehends the language of
 nature; it has become too simple for him.'"

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"The members of the most rigid orders of the Catholic Church,
 the Carthusians, the Trappists, and Camaldolites, all abstain habitually
 from flesh; and it is remarkable that these monks have ever been noted
 for health, strength, and vigorous old age, and never has a contagious
 disease been known in their cloisters."

"Asclepiades, the great physician, whose fame still echoes
 through the ages, invariably cured his patients by prescribing for
 them herb and vegetable diet, and he himself wagered never to be
 sick so long as he abstained from flesh."

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"In his work on the "Art of Prolonging Human Life,," Hufeman
 says: 'The men attaining the greatest age on record have not been flesh-
 eaters, but, on the contrary, strict vegetarians.' Even Liebig asserts
 that grains, particularly wheat, contain quite as many, perhaps more,
 nourishing qualities than meat; and of the so-called flesh-diet, he says,
 'To the really weak, meat broth imparts no vigor.'

"Perhaps it is not generally known that the trained athlete
 of old was compelled to abstain from flesh to acquire great strength;

who the authority or authority?

and the porters, or carriers, of Constantinople and Rio Janeiro, who carry on their shoulders for ^a long distance, weights often reaching five or six hundred pounds, the sturdy Scots, Swiss, and Tyrolese, and the indefatigable field laborers of Italy, all live on fruits, oatmeal, maize, and polenta.

"In fact, it may be said if a vegetarian has committed no early dietetic sins for which he must atone, or has inherited no physical infirmities from diseased parents, then it is simply a shame for him ever to plead sickness; he will be a living exemplar to himself and others of the truth of the old proverb: 'Modicus cibi, medicus sibi'-- 'He who eats temperately and naturally may be his own physician.' It must be admitted by all that the stomach is our most abused, most maltreated organ; and though intended as our good-natured, obedient servant, yet man's impositions and exactions are such that, after long-endured misery, it rebels, and becomes his enemy and his tyrant.

"It is also not generally known that the word 'vegetarian' is not derived from 'vegetable,' but from the Latin, homo vegetus, meaning, among the Romans, a strong, robust, thoroughly healthy man."

"In England butchers cannot serve as sworn functionaries in cases relating to murder. It may be justly claimed that vegetarians ~~and~~ the only genuine friends and protectors of animals."

Ueber Land und Meer, Good Health, 1889, p. 166

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Sinclair's "Code of Health", 1844, Sixth Edition.

p. 16, Appendix

" Prof. Finke's Medical Geography, Vol.1, p. 449.- As soon as the negroes are landed, he observes, they are immediately examined with regard to their health, as unblemished slaves are principally sought after. Slave-dealers therefore, are well acquainted with semiotics, (the doctrine of signs or symptoms), and I have somewhere read, as stated in the text, that the great Boerhaave learnt the characteristic signs of perfect health from slave-dealers. At the sale, many blemishes are attempted to be concealed; when they are discovered, they very much diminish the value of the slave. The want of a tooth, for example, makes a slave worth two dollars less. Twenty-four hours are allowed the purchaser to examine whether his slave be sound or not."

Sci. Amer.
Nov. 1932

OUR POINT OF VIEW

Too Old at 40?

TWO or three years ago there appeared simultaneously in American and British periodicals a long series of articles and letters bitterly assailing industry's rapidly growing practice of classing as too old for employment a man of forty. Not only did this habit affect the industrial worker but also the office worker of the non-executive class and the professional man. Younger, "more alert" men were wanted, so these older ones were discharged and found it very difficult to obtain new jobs commensurate with their training and experience. The practice is still observed, and nothing much seems to have been done to aid the despairing "antiques."

Now, however, a psychologist, Dr. Walter R. Miles, who has previously written for *SCIENTIFIC AMERICAN*, announces the results of a series of tests which he says proves that this age limit of industry is mere "calendar worship." In these tests, in which 863 persons, aged from 5 to 95, figured, he showed that motor ability, such as hand and foot skill, falls off with age but not as much as sometimes believed; that in reaction time, 25 percent of those over 80 were as quick as the average for the group; that, in intelligence, a quarter of the oldest subjects scored above the general average; that imagination showed no appreciable age change; and that in acuity of eyesight, perception, and memory, the older subjects made good scores.

In this connection, we recall a remark Henry Ford once made to us in commenting on the practice of one European nation of giving old-age pensions to all persons over 65 years of age. "To think," he said, "of being shelved as useless at what should be one's most productive age!" Solon, Sophocles, Pindar, and Anacreon labored on splendidly as octogenarians. Goethe, Kant, Buffon, Newton, Fontenelle, and Harvey—the discoverer of the circulation of the blood—did some of their best work after 80. Landor is said to have written his most beautiful "Imaginary Conversations" at 85; Izaak Walton's pen was most fluent and forceful at 90; Hahnemann married at 80 and made some of his most fruitful discoveries at 91; Michelangelo's brush at 81 was as vigorous as it had been at 21; and Titian was doing good work at 90.

Each year a large New York firm lists the deaths of about 60 successful

men who have died in the preceding year. Holding high offices in large corporations at the time of their deaths, most of those listed have passed 60 and a large percentage have passed 70, 80, and even 90. True, these men were executives and those mentioned above were artists and scientists, not industrial workers or office "help"; but if age added experience to their early training and ripened them into men of large affairs, so too should years of conscientious application to a job make of the worker, white collar or denim variety, a valuable asset to his particular business. The latter does not so often become physically so old at middle age that he can be arbitrarily classed as useless; but he does sometimes allow worry about the future to give him a senescent attitude. The need, therefore, is for further research in this important psychological subject and perhaps the employment by corporations of psychologists who can scientifically gage the abilities of personnel. The man so often "too old at 40" may be a conscientious worker whose rich empirical knowledge and the intelligence with which he applies it will more than offset his loss of speed and physical ability even up to the age of 60 or 70.

Airplane Engine Reliability

AMONG the many records for airplanes set up at the National Air Races, recently completed in Cleveland, there was one which was not accorded the applause to which it was entitled. This was the lack of a single engine failure during the several days of the races. This record is all the more remarkable in view of the fact that many of the engines on the racing planes were "suped-up" so that they had a performance output of three or four times their rated horsepower. It may seem impossible that such a result could be obtained—that the materials in a 200 horsepower engine, for example, could withstand the terrific strain of producing 600 to 800 horsepower—but such is said to have been the case at Cleveland.

It used to be that engine failure was the most frequently stressed cause of airplane mishaps. The engine reliability record of the National Air Races shows why this is now the exception rather than the rule—because engines are now built with a very large factor of safety as regards the materials of which they

are constructed and the precision with which they are assembled. The result is that the flying public now has every confidence in airplane engines.

Peace in Radio

WE have several times taken the opportunity to protest in these columns against the abuse of radio broadcasting by advertisers. A break in the clouds appears at the moment of going to press. One of the large broadcasting chains has announced that it will place limitations on the amount of time that may be devoted by each program "sponsor" to direct advertising, and on the position of the sales appeal in the broadcast. When will some daring advertising executive test the feasibility of a simple announcement of his company's name and product as the only advertising in his program? The reaction of the intelligent listening public should be instantaneous and gratifying.

Expensive Babies

THE eugenists and the geneticists have both recently had their say, in separate conventions of course, concerning the future of the human race. The most despairing note that emanated from each seemed to center about the fact that the morally and culturally higher classes in this country are practicing too much birth control.

Commenting on these two conventions, a woman writes, in a letter to *The New York Times*, that the scientists overlooked the economic reason for "birth control" among our university classes. She feels that babies are too expensive and says that "our more intelligent young people are unwilling to bring children into the world without assurance that they will be able to care for them decently and educate them properly. As things now stand, they are forced . . . (1) to postpone having children until late youth; (2) to limit the number rigidly; (3) or to descend to the pauper class and accept charity."

Close observation shows that she is largely right. Is she also right in suggesting that a premium be placed upon the reproductive energies of the better class of our young people, especially by the reduction of maternity costs? It is a question of national import and we shall hail the day when governmental interest is directed intensively toward finding an answer to it.

The Joys of Old Age

SIR OLIVER LODGE, one of the leading scientists of the world, has recently passed his seventy-sixth year, but thanks to a temperate, carefully regulated life he is still active. In a recent interview published in the *Liverpool Daily Post*, he declares that notwithstanding his advanced age he is enjoying the happiest period of his life.

“‘Age,’ he said, ‘has more influence, and can do more good. Of course there are many things that only youth can do, but I think that as the years pass life gets fuller and larger, and, on the whole, happier. You can do more of what you like in place of what you must. Your nose is applied less to the grindstone. People make more allowances for you.

“‘Again, I think that in age you take a brighter outlook on life and become more tolerant. You are no longer in competition with others, and so can appreciate better the activity and enthusiasm of young people and their anxiety to learn. There is a pleasure in being able to teach, and I do believe young people are anxious to learn nowadays. In my youth it was a hard struggle to get education for the general mass of the people, and they did not seem to care much about it. Now they do. I did not enjoy my schooldays at all, but youth has a happier time now.

“‘The difference between youth and age is the difference between seedtime and harvest. Just as a tree fruits in autumn, so in age should a man reap the fruits of the work of youth. Enjoyment then is not sought; it comes as one of those things that are added unto us. I think it was Dean Stanley who told the boys of Westminster School that it is a mistake to imagine that the best part of life is over when youth has gone. That is true. Life grows in value as one grows older’.”

Clipping the Wings of Time

SAID Babbage, a classical authority, "There are few things less subject to fluctuation than the average duration of life of a multitude of individuals." The statistical studies of the Metropolitan Life Insurance experts and others have shown this statement to be wholly erroneous. There is no "inexorable law of mortality."

A great English medical authority, M. Clifford Allbutt, held that senility is due to time and that hardening of the arteries cannot be delayed or prevented because "we cannot hold back the wings of time." This pessimistic attitude has long been an obstacle to progress in the promotion of life extension ideas. But a new day has dawned. Modern research has shown that a thorough application of science to human living may prolong life to an extent almost unbelievable.

One of the features of the recent meeting of the American Association for the Advancement of Science in New York was the address of Doctor Fisk of the Life Extension Institute which pointed out the striking fact that there is no physiologic limit to life. In other words, old age is not a normal state, like adolescence, but is a disease, and a sort of malady that can be postponed if not altogether prevented.

The life of the fruit fly has been lengthened by control of temperature to nine hundred times its usual life. If the same methods were applicable to human beings, a man could be made to live nearly two thousand years.

Science has done marvelous things for agriculture, for mining, for every human industry, but has scarcely yet begun to do what may be done for human life.

If men and women could be induced to eat and drink and conduct themselves generally in the orderly and physiologic manner in which horses, cows and other domestic animals are required to do, their efficiency and their longevity would be at least doubled.

Said Doctor Fisk: "When I am asked therefore, as to the probable duration of human life in the remote future, I am compelled to answer that science has no present data upon which to determine this, but that the prolongation of human life far beyond the present most favorable life cycle lies within the legitimate bounds of scientific effort. I also answer that those who say that the life cycles of living organisms cannot be prolonged are facing what is known as a Spencian tragedy—to use Huxley's definition—that is, a deduction killed by a fact.

"Scientific workers who scorn the implication that they incline to fundamentalism, nevertheless

are the most rigid kind of fundamentalists in their attitude toward the problem of the fixity of life cycles.

"Even among those who admit offhand that the life cycles of living organisms are not fixed, there is a subconscious conviction that in a practical sense this is so and that it is more or less futile to attempt to interfere with the course of Nature or the plans of the Deity, depending on the religious or the philosophical views of the individual.

"Has it been decreed somewhere, somehow, by somebody, that the tissues of the human body, or of any other living organism, shall become lifeless within a certain length of time? With those who hold such views purely as a matter of religious conviction, I have no quarrel; but as a scientific proposition it is untenable.

"At once we see the implied and essential fundamentalism of such a view which actually is quite as crude in its aspect as the concept that all existing organisms are descended from those that came out of the ark.

"Whether we use the term 'nature' or 'creator,' there is involved in such a concept the inevitable thesis that life cycles of living organisms have been fixed by edict and not through evolution or reaction to conditions in the universe."

Mortality Statistics

LIFE insurance mortality statistics have long since demonstrated that the expectation of life is less in those who are overweight than in those who are slightly underweight. A chart exhibited by the Metropolitan Life Insurance Company at the annual meeting of the American Medical Association, showed that overweight men have the highest cancer mortality rates, and that the greater the amount of overweight the higher the

death rate from cancer. In the experience of forty-three life insurance companies the mortality rate for cancer for insured men over forty-five years of age was one hundred and twenty per one hundred thousand for those who were twenty-five pounds or more underweight; one hundred and forty-four for men of average weight, and one hundred and fifty-six for men who were fifty pounds or more overweight.

1928

High Rate of Maternal Mortality

THE United States has a higher death rate for mothers in child birth than any other country except Chile. The rate is one-third higher than that of England and Wales, and more than twice as large as that of Denmark, Italy, Japan, The Netherlands, New Zealand and Sweden.

Heart Disease the Chief Cause of Death

AT the recent annual scientific meeting of the American Heart Association, it was brought out that heart disease is now the principal cause of death in the United States and seems to be on the increase. Many physicians believe that responsibility for this increase rests upon faster living. Heart disease death statistics show a great increase after the age of forty. At 30 years of age the rate is only 40 per 100,000, while at 40 years it is 100 per 100,000.

New Orleans ranks first among the cities of the nation in deaths from heart disease, with a rate of 321 per 100,000. Albany, N. Y., is second, with a rate of 283 per 100,000. The country-wide rate in 1925 was 186 per 100,000, as compared with 132 in 1900.

Dr. Henry Albert, Health Commissioner of Iowa, called attention to the fact that more deaths

from heart disease is one of the penalties people are paying for the increased span of life achieved during the past forty years. This disease frequently results from infectious disease which formerly killed the patient. Physicians can now bring the patient through the acute infections but they have not learned to prevent the after-effects. The injury suffered by a scarlet fever victim, for instance, may not become apparent for twenty years, when it may reveal itself in the heart, liver and other organs. He estimates that about 25 per cent of all deaths from heart disease have their origin in rheumatism. The heart disease age is forty-five and over, when the weakness resulting from former maladies manifests itself.

1928(?)

The Longest Life Expectancy

THE inhabitants of New Zealand appear to have the longest life expectancy of any country in the world. Whereas in America the present expectation of life is fifty-eight years, in New Zealand female lives have already the expectation of sixty-five years and the male expectation of life is sixty-two and three-quarters years.

Life after Sixty

THE *Welfare Magazine* has published a series of articles by Doctor Dorland of Chicago on researches conducted by him on the abilities of men over fifty years of age. His conclusion is that "fifty was the average age at which four hundred of the famous men of history did their best work, and world leaders now living reach the height of their ability at from sixty to seventy."

Viewed in the light of these facts, the statement recently made by Doctor Wheatley in an address before the Society of Medical Officers of Health, is somewhat surprising. "Past a certain age," he said, "but probably averaging about sixty, life is no longer a national asset but a national burden. This general truth is not vitiated by the fact that many men over sixty or seventy years of age have done work of extraordinary value."

In commenting on this statement, the *British Medical Journal* says: "It is a complete fallacy to regard the exceptional merely as a contribution to the average, and not to give it its own, sometimes enormous, value over and above such contribution. It is a fallacy, too, even when calculating purely economic values, to consider only physical well-being. True, all around perfection is what is aimed at. But in placing our imperfect results in the health balance, we must weigh up what may go along with a feeble physique: a powerful and well-poised mind, and surely something more than both of these in the personality that may be more enduring than either."

The Longevity of Birds

THE following amazing figures concerning the longevity of different species of birds are stated in the Wisconsin State Board of Health Bulletin: The average length of life of the wren is three years; robin, twelve years; blackbird, twelve; quail, fifteen; pigeon, twenty; sparrow, forty; goose, fifty; parrot, sixty; crow, swan and eagle, one hundred.

A House That Never Had a Death

AN aged negro woman of Caspiani, La., recently died at the age of 102. She was the head of five generations, all living on the Hutchinson farm. Mr. T. S. Hutchinson, of Shreveport, La., whose father built the farm house in the early 50's, and who is one of nine children, calls attention to this negro woman's advanced age, and refers to the Louisiana cotton farm as apparently a health resort. That health resorts are mostly within, and are created by living habits, is demonstrated by a further item from Mr. Hutchinson, as follows:

"I have never seen anyone smoke within the walls of our seventy-year home. Seven of the children were boys. When they became twenty-one years of age, each one received a fine watch for not using whisky or tobacco *in any form*. One of them died at the age of thirty-eight from typhoid. The rest are still living, and in splendid health. The youngest will be fifty years old in December. They are in business together, and not one of them uses whisky, tobacco, or 'cuss words.' "

Increasing the Span of Human Life

IN an address before the Nebraska Academy of Science, Dr. Victor E. Levine stated that "in the 16th century the expectation of life at birth was 21 years; in the 17th century it was 26; in the 18th century it was 34; in 1890 it was 43; in 1900, 49; in 1910, 51, and in 1920, 55. The 100 year mark will be reached by the year 2,000, if the increase in the span of life continues."

Death Rates of Adults Increasing

THE statistics for 1927, now available, show that in this country, the death rate above the age of thirty-seven is increasing. The life expectancy at birth had increased to 59.10 years. In 1921 this figure was 58.01 and in the intervening years had fluctuated between these points. But the improvement has been wholly in infancy. For every year above one, the life expectancy was less at the close of 1927 than six years previously. To be entirely accurate we should except the years above one hundred and two. Obviously this is of no significance.

Various authorities have announced a belief in the possibility of greatly increasing the span of life. They stress the lessening death rate from tuberculosis, typhoid fever, diphtheria, and other diseases. As a matter of fact, greater mortality from cancer, heart disease and other ailments of

middle life and beyond, has more than neutralized this advantage. Thus last year, one of the large insurance companies paid out more than one-seventh of its death disbursements in claims arising from heart disease. The per cent of the total paid out in heart disease claims has been increasing, almost continuously, for eight years.

In the decade 1901-10 there was an increase in the mortality of the higher years of life. In the next ten years there was a decrease but since 1920 the tendency has again been upwards.

The statistics for 1927 show that the age of twelve is the time of life when there is least likelihood of death. The mortality of infants under one year was 54.68 per thousand. The next year this dropped to 9.58 and continues to decline until twelve, where the rate is 1.67. After that it increases steadily as follows: at twenty-two, 3.98; at thirty-two, 5.01; at forty-two, 8.37; at fifty-two, 14.68; at sixty-two, 29.44; at seventy-two, 69.74; at eighty-two, 149.30; at ninety-two, 272.93 and at one hundred and two, 434.44.

Brains Defy the Years

“**B**RAINS do not grow old, but become impaired by disease and abuse,” said Dr. Frederick Tilney, Professor of Neurology at Columbia University, at a notable conference on the problems of old age. He declared that “no evidence thus far deduced is sufficient to convince us that there is such a thing as a strictly old brain. The brain in

aged people may present certain changes from disease, but these are incident to many pathological assaults upon the tissues, sustained during life, which in some individuals more and in others less are, in all alike, the consequences of infections, indiscretions, or other morbid influences. A brain is not necessarily senile simply because it is ninety-five years old. Its possessor may be active and alert in the business of life. But if such a brain bears in addition to its burden of years the effects of disease, it is sure to give proof of failing function in direct proportion to the gravity of the pathological lesions. Old age of the brain is much more often the result of disease than of some inherent aging process.”

How Long Do We Live?

A LIFE table constructed by beginning with one hundred thousand children born and deducting the number who will die in each succeeding year, according to the existing death rates at each age group, is given by Dr. Linsley Williams in *International Clinics*. Each year we find the number still alive diminishing, but with our present expectation of life these one hundred thousand individuals will live in the aggregate 51,577,502 years—an average of 57.7 years. Out of 100,000 individuals

72,074	will live to be	fifty
59,639	“ “ “ “	sixty
41,705	“ “ “ “	seventy
15,331	“ “ “ “	eighty
1,780	“ “ “ “	ninety
33	“ “ “ “	one hundred

These last will all have died before the one hundred and seventh year has ended.

In our modern civilized communities, says Doctor Williams, the average expectation of life has gradually increased as a result of properly applied health measures and an increased amount of information on health matters among the general public. It is evident that these measures alone will not suffice unless the individual may develop sufficient character and self-control to lead a life of moderation in physical exercise, mental work, diet, rest, the amount of time devoted to each divided so that there is no lack or abuse of any of these factors.

Life Expectancy Past Forty Diminishing

PROFESSOR FORSYTH of Dartmouth College, in a recent article in *Science*, maintains that the average length of life is declining instead of increasing. The decline is noticeable after the age of forty, and is most pronounced at the age of seventy. In concluding his article, Professor Forsyth says:

“The whole picture, from our earliest records in 1890 to the present time, points consistently and inevitably to a future of a declining average length of life until the American adult wakes up to the fact that the odds are at present heavily against his living as long as his father or grandfather. Some will say—and no doubt truly—that it is all a natural consequence of the great drift to the cities. Others will go farther and say life has become too fast and strenuous and that we do not know as yet how to adjust ourselves to such a life. To the medical authorities the whole problem will loom as one of relieving the strain upon the heart. But little will be accomplished until the American adult himself is duly informed and made to realize that he is in the midst of a decidedly losing fight and that the situation will continue until he applies himself energetically to be superior to his environment. Moreover, each adult must fight his own individual battle, since he usually brooks no interference with his own individual mode of living. Medical authorities and scientists can be depended upon to care for the children and their diseases, but they have little or no chance to interfere with the lives of adults.

“It truly looks as if it is going to be a losing fight for some time to come, for although some adults are making a commendable effort to live sane lives, the vast majority seem very indifferent and many give apparently no thought whatever to habits which they clearly know are bad and which they know they could easily discard. There is surely no worse influence than that wielded by well-meaning authorities who go around airing

their ill-founded beliefs that all is going well and that before long everybody is going to be living seventy-five to a hundred years!”

Professor Forsyth's views are entirely consistent with the fact that there has been in recent years no change in the habits of the American people likely to have produced an increase in the life expectancy of persons in advanced years. On the other hand, there is a notable increase in disease of the heart, blood vessels, kidneys and in degenerative disorders in general, the natural result of the increased consumption of alcohol, tobacco and general unhygienic modes of living, rather than the opposite. It is possible that human longevity may be increased, but this result can only be expected when there is a general return to simple, biologic living habits.



[Pacific and Atlantic Photo.]

TREE REPUTED TO BE THE OLDEST IN NEW ENGLAND. Cedar on cliff overlooking sea at Manchester, Mass. The late Louis Agassiz declared the tree was 1,000 years old.

*Full
Agassiz*

STORY OF CLUB TOLD TO WORLD

Article About Three Quarter Century Club Meeting Is Published in Magazine.

FIVE YEARS OLD NOW

Vivid Account of Meeting Given by Leta B. Browning Of the Sanitarium.

The story of Battle Creek's Three Quarter Century club spreads farther over the United States each year, and as it spreads the news of other cities forming similar organizations keeps coming back to Battle Creek. The latest bit of nation-wide publicity given the organization is in the Battle Creek *Good Health* magazine which, in its current issue, publishes part of an account of the 1927 meeting at the Sanitarium chapel as written by Leta B. Browning of the Sanitarium.

The complete article written by Miss Browning is as follows:

There is something very beautiful about old age. Whether it is the dignified atmosphere which so readily becomes a part of it, whether it is youth's unusual contact with satisfaction and contentment, or whether it is the frosty sheen that sunshine gives to silver hair, I do not know, but surely there is a mysterious something that is undefinably lovely and wholesome and beautiful about old age.

It was a most unusual party that I attended, or perhaps I should say, observed, for I did not have all qualifications to be an invited guest. It was a most exclusive gathering. One had to be seventy-five years old to become eligible for membership, and that is no small achievement. And seventy-five years represented the youth of the party, for there were many lovely guests, both men and women, who were in their late nineties. To be able to don one's party clothes at ninety and saunter off for a delightful festive afternoon must be indeed an indescribable joy. There is an old saying that we are only as old as we feel, and if that is true and, in a sense it must be, then the guests at this particular party were the eternal Peter Pans and Wendys that Barrie has brought so close to our hearts.

Five years ago there was organized a club known as the "Three-Quarter-Century Club." Dr. Kellogg decided that the older people who had worked so diligently to make Battle Creek all that it is, were not receiving all the attention socially that they should, and so he got his friend of many years, Mr. Charles H. Wheelock, to hunt up the old folks of the town and gather them in for a big party in the banquet hall of the Battle Creek Sanitarium. There were 253 persons present, whose combined ages totaled 21,000 years. The average age was 83. There was one centenarian in the group.

The first party was such a success that at Mr. Wheelock's suggestion,

an organization was established under the name of "The Three-Quarter-Century Club", and there are now over 600 members. Annually Dr. Kellogg acts as host to the club and during the year Mr. Wheelock, as secretary, keeps careful watch over the members, sending each one a birthday greeting, keeping interesting individual records and in a hundred ways helping to make life pleasant for the aged members of the club. And so five years have rolled along since the birth of this unique organization, five years that have taken their toll of many who have gone on, and of others who have come to take their places, and it is of the fifth annual meeting of the club which I attended and of which this is a brief account. Early on a late June afternoon, even long before the appointed hour, the guests began to arrive—eager with anticipation of again meeting their old friends with whom they have so much in common, and excitably keen to all the details of this festive occasion. It had been originally planned to hold the party in the large grove surrounding Doctor Kellogg's home, but non-sympathetic clouds gathered in the west and promised rain, so a part of the big outdoors was exchanged for the spacious chapel in the Sanitarium. Spring flowers in great quantities converted the chapel into a veritable fragrant garden and by the time the guests were due, the sun came out, just like he couldn't stay away, and poured a flood of sunshine through all the windows. The secretary of the Chamber of Commerce had provided dozens of automobiles to gather the members in from their homes and at two o'clock there was an almost steady procession of cars bringing them in. I watched them as they entered the building, these lovely young old people coming so eagerly with quickened step and laughing eyes to this, their very own party.

One ninety-year-old guest whom I assisted to the elevator said, "Hurry, dear, I don't want to be late. I've come all the way home from California for this because I want to see all my old friends once more. You know next year, my dear, I may—well I may not even be here." No doubt the same thought served as a stimulant to many to make the most of the moment's opportunities.

And other guests followed, a long line of picturesque figures, ladies in lovely shawls and bonnets and not a few old soldiers on whose bosoms were pinned war decorations—not trophies from the great war with which we are so familiar and in which their great grand children carried the torches, but of the Civil war which perfected and welded with enduring bonds the union which the Revolution began.

I thought as I looked at these dear old people, what a wealth of experience had been theirs and if youth could kneel at the feet of any one of them for only one hour, if youth only would, what golden lessons might be learned from their ripened experiences. But, unfortunately few are willing to profit by the experiences of others. We insist on repeating the same mistakes that others have made and profiting only by our own blunders.

I tried to picture these remarkable people in their youth, sixty and seventy years ago, and follow through with them the marvelous discoveries that have been made

during their span of life. Some of them crossed the ocean when it took several weeks for their little frail vessels to fight their way through the storms, and today—Lindbergh crosses it in a few hours, and palatial, luxurious express liners, carrying two and three thousand people, make a crossing in less than a week. Residences that were mansions in those days have become commonplace and the one-horse shay has long been sacrificed for a motor car.

How these dear old ladies must have worked in their day—cabins to build, cloth to weave, candles and soap to make, fruits to preserve, corn and herbs to dry, winter wood to gather and children to be taught, to say nothing of many an all-night vigil at a sick bed. How many little children these women have mothered, how many little prayers they have heard, how many lullabys they have sung, and how many curtains they have drawn on eyelids closed—not to be reopened. Theirs was not an age of jazz, delicatessen and motion pictures.

A hanging oil lamp, an open fire, a purring kitten on a rag carpet, and the parlor was arranged for company. A bobsled and some buffalo robes made the motor, waiting without.

Theirs is a privileged life, for since their sunrise have come many wonderful changes in all that makes up life, and before their sunset, for we pray that they may have still many years ahead of them, will have come many more spectacular happenings that will fill their last years with wonder. Through newspaper, magazine and motion picture, the world has been brought to their doors, and they have travelled far. The Victrola and the radio have brought to them the world's loveliest music; famous artists sing and play to them as they rest comfortably in their rocking chairs before their own hearths.

Electrical carpet sweepers clean their brightly illuminated rooms, electrical machinery does the laundry work, electrical cooking equipment prepares their meals, and the telephone stands ready at their finger tips for almost instant communication with their dear ones, no matter where they may be. In the evening there are automobiles and motion pictures for their entertainment, and all of these things have come into being in the course of their own lives.

At their first party five years ago a well known picture company had machines and operators ready to weave into civic history this unusual gathering, and at subsequent parties these dear old folks have seen their own faces on the silver screen.

Dr. Kellogg in welcoming his guests said: "It seems to me a most wonderful thing that I am alive and here, and I dare say it seems so to every one of you. I want to tell you the reason why we are here. We owe it to wonderful progress that has been made in science. In less than twenty years the average length of human life has been extended fifteen years. Just think of it; without this progress we would all have been dead at 60. We would have been buried fifteen years ago if it were not for the fact that within the last twenty-five years the application of science of human life has increased the average length of life, and the rate of increase of average longevity has been such that Professor Irving

Fisher, of Yale university, Dr. Hornell Hart, of Bryn Mawr college, and a number of others who have been making a careful study of statistics have made up their minds that if we keep on at the same rate of increase by the end of this century the average length of life will be one hundred years. Then they will have instead of a "Three-Quarter-Century club", a "Century and a Half club", a "Sesqui-Century club", or even a "Two-Century club".

Now, there is no natural limit to human life. I am going to say that again, because it is such an incredible thing I am sure you will not believe it when you first hear it. Physiologic science, biologic science, asserts with considerable degree of certainty that there is no natural limit to human life; that there is no reason, no intrinsic reason, no certain, positive reason why a person should not go on living indefinitely.

Why don't we live forever then? That is the question. An eminent French physiologist said, "Man does not die; he kills himself." The fact is we all die by accident. We do not die because we have to die because there is no natural limit to human life. We die by accident. We happen to run across somebody who has smallpox and the smallpox kills us off. The smallpox germ destroys our lives, or the typhoid fever germ or some other kind of germ, or an automobile runs over us, or something else happens. It is an accident that leads to our passing out.

What we are trying to do here at the Sanitarium is to find out how to avoid killing ourselves. Professor Hart, who has been making a study of this subject, says that in the year 2000 the average length of life will be at least 100 years, and in that year babies will be born that will live 200 years and some of them possibly 250 years. So you see, although we are seventy-five years old and over, we are still young folks. Of course we cannot live forever. Everything wears out in time; but by biologic living or scientific living, life may be greatly extended."

Then followed an interesting program to which some Sanitarium guests of international fame contributed.

Following this the annual prizes were presented. The first was the longevity prize. Mr. Louis Lamora, born March 7, 1830, was awarded the prize for men, being 97 years young, and Mrs. Mary Campbell, born August 15, 1831, won the prize for women, having attained 96 years. The prize winners stepped upon the stage and received huge bouquets of beautiful roses mingled with the loveliest of wild flowers.

The Sanitarium orchestra played old time songs and it was indeed wonderful to note the zest with which great grandmothers and great grandfathers, some with tear filled eyes, joined in singing the tuneful melodies of long ago.

The last item on the program, evidently looked forward to with much interest by the guests was the delicious luncheon served by the Sanitarium dieticians and students of Battle Creek college.

And then it was announced that the automobiles were waiting at the door, and after many handshakes, the members of the Three-Quarter Century club returned to their homes, each one determined to keep up a good fight against old Father Time and be on hand next year.

THE POTENTIALITIES OF EXTREME OLD AGE

BY FRANCIS G. BENEDICT AND HOWARD F. ROOT

NUTRITION LABORATORY OF THE CARNEGIE INSTITUTION OF WASHINGTON, BOSTON,
MASSACHUSETTS, AND THE NEW ENGLAND DEACONESS HOSPITAL, BOSTON,
MASSACHUSETTS

Read before the Academy, Tuesday, April 24, 1934

Our hospital records and the doctor's case files are bursting with information regarding the frailties and disintegration of old age, but only the life insurance records contain any great amount of reliable information regarding the normal conditions in extreme old age. Hygienic betterments, improved feeding, nursing and housing have prolonged life, chiefly by preventing the death of children and young adults, but any real accumulation of data contributing to our knowledge of the influences favoring extreme old age is sadly lacking. According to Oliver Wendell Holmes, Senior, one should be careful in selecting one's parents. Undoubtedly a good family history of longevity is the one sound factor known to be a reasonable guarantee of long life. Refraining from excess in eating, in drinking, and in other habits of life also aids in the avoidance of many life-terminating factors. Still, many people of exemplary habits and with a good family history do not live the allotted three score years and ten, few reach four score years, and still fewer reach four score and ten. Such fortunate people reaching this goal in good condition afford an important field of observation, and a study of the factors underlying their successful resistance to the vicissitudes of life must ultimately throw light on the rationale of long living. A nonagenarian is usually well spent in his physical and mental condition. He has, to be sure, weathered life's gales and is safe in port, but (to continue the metaphor further) he is as a rule tied up to some well-sheltered dock where life ebbs away slowly, with no cataclysmic transport. Occasionally ninety years is attained with a fullness of mental and physical activity that bespeaks an economic usefulness in life by no means at an end. Indeed, the nonagenarian has demonstrated in a number of striking cases that such length of life with relatively complete mental and bodily powers is a goal that may well be striven for. In the past few have reached it, but in the future more individuals should succeed.

For some time we have been personally acquainted with an elderly gentleman, Mr. Seth W. Lincoln of Worcester, Massachusetts, who by his unusually excellent physical and mental condition has challenged the attention of all who have known him. With a fine spirit of coöperation, Mr. Lincoln subjected himself to a study at the Nutrition Laboratory in Boston last fall. He is a man of alert manner and upright carriage, without the stoop of extreme old age, and carries his 91 years well. His movements are active, free and quick. His voice is strong, both speaking and singing.

The laryngologist, Dr. C. H. Ernlund, who examined his throat pronounced it an extraordinary throat for such an age, without any signs of atrophy of the vocal chords or the superficial membranes of the larynx.

The eyes have had their vicissitudes. A cataract was removed from the right eye at the age of eighty-five, with excellent results. The left eye is considerably obscured, with relatively little vision. Still, the right eye has good visual acuity, with a good angle, and Mr. Lincoln can traverse the business streets of Boston alone, without a cane.

He is spare but presents no obvious abnormalities in external bodily configuration. The usual clinical examination showed that the heart action was regular, the electrocardiograms were normal, the blood pressure (systolic) was 154 mm., the respiration rate was somewhat irregular, but there was no dyspnoea. His hearing is good, and he still has 17 teeth. Laboratory tests gave the following results: hemoglobin, 70 per cent; capillary red blood count, 4,950,000; white blood count, 13,700. The urine was normal as shown both by microscopical and chemical tests. The output of nitrogen was low, about 7 grams daily. Mr. Lincoln eats a rational diet, not at all one-sided or dominated by any of the "food fads." He has always abstained from the use of alcohol and tobacco, eats sparingly of eggs and liberally of fruit.

The family history reveals a number of long-lived progenitors, although none reached his age. His grandparents lived well into the seventies and eighties. His mother lived to be eighty-five, but his father died at the age of twenty-eight from pneumonia resulting from exposure at sea. He is one of a family of ten children, of whom four died before or at the age of 25 years, four died between the ages of 66 and 76 years, and two (a brother and Mr. Lincoln) are still living at the ages of 83 and 91 years, respectively. In general longevity predominated in the family history, except for deaths from acute infections early in life. No deaths are recorded from cardiac, renal or arteriosclerotic diseases under the age of seventy-five years.

Mr. Lincoln is an omnivorous reader, and maintains his intellectual activities by a moderate amount of work for a publishing house with which he has long been connected. Practically all his life has been devoted to the publishing business, chiefly in the printing department, and years of standing at a type case with the consequent confinement have not seemingly affected his general health. The feet are in excellent condition, with good circulation in the arteries of the feet. The mouth temperatures taken on several days were always well within normal limits.

The condition of the cardio-renal-vascular system is surprisingly youthful. Roentgenograms disclosed no calcification in the aorta or arteries of the legs. The heart is of normal size. The kidney function is normal. The small arteries of the retina show only the slightest thickening of their walls.

The chemical examination of the blood likewise showed a normal, non-protein nitrogen, sugar, cholesterol and alkaline reserve. The blood cells appeared normal in number, size and staining reactions.

An extraordinary balance of the endocrine glands is indicated by the normal texture of the skin and hair, the absence of dryness and thickening of the skin. Libido normal for a man in youth is preserved. The pubic hair and the general distribution of hair are normal. The pancreatic function is normal.

No one measure of the level of vital activity, considering the body as a whole, equals that of the total metabolism. Hence on a number of days Mr. Lincoln's oxygen consumption (see table 1) and respiratory quotient

TABLE I
SETH W. LINCOLN
91 YEARS, 58 KG., 172 CM.

HEART RATE	PER MINUTE RESPIRATION RATE	OXYGEN CONSUMPTION, CC.
67	9	147
64	9	151
69	10	150
68	12	165
Avg. 67	10	153

were determined, and from these the heat production was calculated. The measurements showed great uniformity. On the average, this man's basal oxygen consumption, that is, while lying quietly before breakfast, was 153 cc. per minute. This corresponds to a total 24-hour heat production of 1063 calories or, expressed per unit of weight, 18.3 calories per kilogram per 24 hours. The 24-hour heat production per square meter of body surface was extraordinarily low, 629 calories, indeed lower than that of any other man we have ever measured. One might at first think that this low metabolism indicated extreme muscular weakness, if not senile debility. This inference is entirely contrary to the physical and nervous makeup of the individual, who impresses everyone by his unusual vitality, erectness of posture, quickness of movement and strength of voice. Another interpretation is that this man's body machine is working with extraordinary efficiency and that when it is not performing muscular work, it resembles the automobile engine while idling, that is, it is idling with an extremely low consumption of power.

Unfortunately too few nonagenarians have been measured for comparison with Mr. Lincoln. There are, however, two striking illustrations. We have fortunately, thanks to Dr. W. H. Stoner, a few observations made some months before his final illness on Dr. W. W. Keen of Philadelphia, a man of essentially the same weight as Mr. Lincoln but shorter and therefore

with a relatively larger proportion of adipose tissue. Extremely accurate observations were also made on several days by Dr. C. G. L. Wolf of Addenbrooke's Hospital, Cambridge, England, on the well-known alienist

TABLE 2

NONAGENARIANS

	OXYGEN PER MIN. CC.	DEVIATION FROM HARRIS- BENEDICT STANDARD P. CT.
Seth W. Lincoln	153	- 4.5
Sir James Crichton-Browne	192	+17.6
Dr. W. W. Keen	193	+26.2

Sir James Crichton-Browne, at the age of 89 years. At that time the weight and height of Sir James were nearly identical with those of Mr. Lincoln. With both these elderly gentlemen (see table 2) the oxygen consumption was 193 cc. per minute, as compared with Mr. Lincoln's rate of 153 cc. Those who knew Dr. Keen and who know Sir James personally would instantly classify them as men of dynamic personalities, living with challenging intensity expressed in almost incessant muscular movements measurably quicker and more forceful than those of Mr. Lincoln, although Mr. Lincoln's physical activity is of itself most extraordinary. One might say that Sir James and Dr. Keen were continually burning their fires under forced draft, whereas in Mr. Lincoln's case the fire is well banked to burn more slowly and economically.

However, instead of wasting time in speculating as to the reason for the difference in heat production of these gentlemen, one can simply point out that it is this type of investigation that will lead us in the near future, we hope, to a far better understanding of the secrets of the mechanics of long life. Here are three men, each in his way in unusually fine physical and mental condition, who have reached four score years and ten, and, far from being burdens to their families or to society as a whole, are most useful and active members of society.

One outstanding feature in Mr. Lincoln's personal history is that he has never suffered any great sorrows. Moreover, although a man who has had to earn his living, he has never experienced any tremendous financial stress. He has a most optimistic outlook upon life, spreads cheer and happiness wherever he goes and is deeply religious. His fifty-nine years of married life have been romantic. Perhaps his character can be no better described than by saying he is a man who does not worry. This cheerful, optimistic outlook on life, with the philosophy of accepting calmly the ups and downs that must necessarily enter into a life of ninety-one years, undoubtedly has relieved him of much of the excess tension and nerve-wracking, wearing strain that comes all through life to so many of our intense American business men.

It is impossible from observations on this man or any other few individuals to lay down any definite rules for longevity, but we are certainly justified in concluding from the study of this case that, in the first place, a good family history is a great asset, secondly, that temperate habits of life are important, and third, that if one is so fortunate as to be able to adjust one's life with others and with one's environment in such a way as to avoid worry, this undoubtedly plays a rôle. The physician can aid in advice with regard to habits of life, eating, drinking and other matters of hygiene, but the psychologist has here a great field in training for mental poise. The psychologist must help to show people how to cultivate an unharassed mind and teach them not to worry. In the attainment of longer life the aid of the psychologist may be as important as that of the physician, for old age is a mental as well as a physical phenomenon.

(The details of this research with subsequently collected observations will shortly be published elsewhere.)





"THIS GENERATION SHALL NOT PASS"

1907

"Some food for worms, some subjects of the seven last plagues, some will be alive and remain upon the earth to be translated."

"At the General Conference at Battle Creek, May 27, 1856, I was shown in vision some things that concern the church generally; . . . I was shown the company present at the Conference. Said the angel, 'Some food for worms, some subjects of the seven last plagues, some will be alive and remain upon the earth to be translated at the coming of Jesus.'" — "Testimonies for the Church," Vol. I, pp. 131-32.

LIVING, AUGUST, 1907	AGE, 1907	DECEASED
Ellen G. White	79	James White
Geo. W. Amadon	74	Uriah Smith
J. E. White	57	Cyrenius Smith
W. C. White	53	Deborah Lyon
T. B. Lewis	66	Sarah Belden
Ogden Lewis	55	H. N. White
Lorinda Nordyke		Dan R. Palmer
May Abbey	52	J. P. Kellogg
Ashael Smith	70	Mrs. J. P. Kellogg
Mrs. D. W. Reavis	54	Josiah Hart
Anna L. Wilson	66	Leonard Eggleston
J. W. Bachellar	69	Cyntha Bachellar
Amilla Bachellar	68	Roxana B. Cornell
Julia J. McDowell	69	Clara Banfoey
Smith Kellogg	72	Jennie F. Rogers
Albert Kellogg	70	A. A. Dodge
Dr. J. H. Kellogg	55	Richard Godsmark
Mrs. Emma Kellogg	57	Mrs. R. Godsmark
May L. King	74	David Hewitt
		Mrs. David Hewitt
		Walter Grant
		Nancy Grant
		Jesse Dorcas
		Elias Goodwin
		S. W. Rhodes
		Henry Gardner
		Mrs. Henry Gardner
		Geo. Lamie
		S. B. Warren
		Martin Phillips
		S. H. Lane
		S. T. Belden
		Samuel Warren
		Mrs. S. B. Warren
		Jarvis Munsel

Fifty-four in all. Nineteen living.
List compiled by Brother C. F. Marvin.

"Transgression has almost reached its limit. Confusion fills the world, and a great terror is soon to come upon human beings. The end is very near. God's people should be preparing for what is soon to break upon the world as an overwhelming surprise."

"Our time is precious. We have but a few, very few, days of probation in which to make ready for the future, immortal life. We have no time to spend in haphazard movements. We should fear to skim the surface of the Word of God." — Mrs. E. G. White.

Sketch of 50 years' work at Battle Creek.

Sketch of work.

How friends have helped.

Sacrifices of doctors.

Camp meeting provision stands.

Tea and coffee in boarding tent.

Meat wagon on ground daily.

Edson White's voice calling, "Have you any fresh fish?

Mother wants some."

Visited camp-meetings uninvited at own expense.

Sanitarium helped, paying salaries.

I paid all traveling expenses of self and secretary.

Borrowed the money. Paid interest for more than twenty
years after turned out.

THE CODE OF HEALTH

1. Breathe Only Pure Air. Live, work, play and sleep in the open air as much as possible and secure pure air indoors.
2. Eat Only Wholesome Food. Eat and drink biologically - fruits, nuts, grains, vegetables, especially greens, milk and other dairy products. Avoid meats - flesh, fish, fowl - also adulterated and other unwholesome foods.
3. Evacuate After Each Meal. Evacuate three times daily, or after each meal. If necessary take an enema at bedtime. Prevent putrefaction and offensive stools by changing the intestinal flora. Avoid drug laxatives. Use laxative foods and food accessories rich in bulkage and vitamins.
4. Masticate Thoroughly. Chew solid and semi-solid foods until smooth and nearly tasteless. Sip liquid foods slowly.
5. Proper Daily Exercise. Exercise sufficiently each day to induce perspiration and moderate fatigue. Walk more; ride less. Hike, swim, bicycle, work out of doors. Use "The Health Ladder."
6. Maintain Correct Posture. Hold the chest up when sitting, standing, walking, and so far as possible when at work. Do not slump.
 Sit with chest held well to fore,
 Feet placed squarely on the floor.
 Stand head erect and lowered chin,
 Hips held back and stomach in.
7. Rest, Relax and Recreate. Take proper rest by change of occupation, recreation and relaxation.
8. Sleep Eight Hours, more if necessary.
9. Bathe Daily. Take a cold water or air bath every morning; sun or light bath once a week if possible; soap and water bath twice weekly.
10. Avoid Poisons. Avoid alcohol, tobacco, tea, coffee, condiments and the habitual use of drugs of any sort.
11. Avoid Unclean and Infectious Contacts. Special dangers - persons with colds or other infections, visits to toilets, infected foods and food handlers.
12. Cultivate Amiability, Optimism, Contentment and Poise.
13. Avoid Petulance, Anger, Worry and Fear. Cultivate composure.
14. Concentrate. At least twice daily, in silent seclusion, for five or ten minutes, concentrate the mind intensely upon physical, mental and moral betterment. Note and follow the suggestions you receive.

PLEDGE

We, the undersigned, Directors and Physicians of the Health Institute, do hereby pledge ourselves, collectively and individually, to heartily co-operate with Eld. James White in his plans for the circulation of the Reformer and the production of such health works as he may deem advisable for the furtherance of the cause of Health Reform.

As a board of Directors, we do also agree to remunerate him for his advertisements of the Health Institute by allowing W. C. White and J. H. Kellogg to board at the Institute and be permitted to enjoy the advantages and privileges of the institution free of charge.

Names

M. S. Merriam
Ira Abbey
E. B. Gaskill
C. M. Comings
H. Lindsay
Benn Auten
J. H. Ginley
Wm. Russell
M. A. Chamberlain
F. M. Lamson

Charles P. Thwing
Western Reserve University
Cleveland

Dr. Kellogg has for many years appealed to me as a union of devotion to scientific research and to direct human values. The desire to know truth, and the desire to help men, are in him joined together in noble harmony.

Charles F. Thwing.

11109 Bellflower Road

Dr. Boldyreff proposed preparing a volume dedicated to Dr. K., but Doctor put a stop to the plan. Dr. Boldyreff gave me these. (1930)

From Professor A. Benedicenti's article "Studies on the Metal Proteins" (Institute of Pharmacology and Materia Medica, Royal University, Genoa, Italy).

"Tutto quanto si e sopra referito e che e il risultato di innumerevoli misure e di molteplici esperimenti sono lieto di aver qui esposto brevemente per partecipare alle onoranze tributate all'illustre Dr. John Harvey Kellogg, il quale colla fondazione del Battle Creek Sanitarium e dei grandi Istituti scientifici annessi ha cosi bene meritato dalla Scienza e dall'Umanita."

(Translation):

This work is a result of numberless trials and painstaking experiments, and I am most happy to offer it here as a tribute in honor to the illustrious Dr. John Harvey Kellogg who by the foundation of the Battle Creek Sanitarium and scientific laboratories connected with it justly deserves recognition from the Science and from Mankind.

22 October, 1930.

Sanitatsrat Dr. C. Gmelin
Wyk auf Föhr
Germany

Dr. W. N. Bodyreff, M.D., Director,
Battle Creek Sanitarium,
Battle Creek, Michigan,
U.S.A.

My dear Dr. Boldyreff:

I am very glad to answer your kind and honorable invitation to take part in a dedication for Dr. J. H. Kellogg's 80th birthday. I also hope that Dr. Schulmann, a very clever pupil of Kraepelin and Nonne, friend and collaborator of Prof. Dr. H. Zondek, will send you a contribution for your publication.

You will be interested in the matter that Dr. Schulmann has been the physician in ordinary of our past Minister of Foreign Affairs, Dr. Stresemann, during the last four years of his life.

I will also get in connection with the first director of the well known Lahmann's Sanitorium.

I am quite sure that you have written already to Dr. Bircher-Benner in Zurich, whose son has been in the Battle Creek Sanitorium once before.

With kindest regards,

I remain sincerely yours,

Gmelin.

30. Oktober, 1930.

Medizinische Klinik, Kaiserl,
Universität, Tokyo.

Sehr geehrter Kolleg!

Ihr Brief mit Datum 24. September dieses Jahres habe ich mit grosser Freude gelesen und kennen gelernt, dass für Dr. J. H. Kellogg, einen sehr Hervorragenden Mediziner, sein 80. lebensjähriges Jubiläum gefeiert werden soll. Ich möchte sehr gern der Feier teilnehmen und in einigen Monaten meine Arbeit zu Ihnen hinschicken. Es ist meine Freude, wenn diese in dem Jubiläumsvolumen aufgenommen wird.

Ob jemand unter Japanischen Medizinern der Celebration, welche in Verbindung mit der 4. Rassenverbesserungskongress zu erhalten ist, beiwohnen wird, kann ich vorläufig nicht angeben.

Mit dem besten Gruss auch an Ihrer Frau Gemahlin,

Ihr sehr ergebener.

I. Shimazono.

Dr. Pasteur Vallery-Radot
Professeur Agrégé à la Faculté de Médecine
Médecin des Hôpitaux

5 Avenue Constant Coquel
B^d des Invalides) Vll
Tel: Segur 84.67

—
Sur Rendez-Vous

30th October, 1930.

Dear Dr. Boldyreff:

Pray excuse the delay in answering your letter of the 19th ult: but I have been away a good deal lately and am rather behind with my correspondence.

I shall be very happy to participate in the publication of the volume which is to be dedicated to Dr. J. H. Kellogg and thank you for kindly thinking of me on this occasion. I should be much obliged to you if you would let me know by what date my article should reach you.

Replying to your letter, any one of my colleagues whose name is set out below would, I feel sure, be very pleased to contribute to your publication and you might write to them mentioning my name.

Professeur Agrégé Jean Hutinel, 7 Rue Bayard, Paris, 8^e.

" " Debré, 5 rue de l'Université, Paris, 7^e.

" " Chiray, 14 rue Pétrarque, Paris, 16^e.

" " de Gennes, 19 Avenue Emile Deschanel,
Paris, 7^e.

Dr. Laubry, Médecin des Hôpitaux, 39 Avenue Victor-Hugo,
Paris, 16^e.

Professeur Agrégé Sézary, 6 Rue de Luynes, Paris, 7^e.

They all rank among our most capable workers.

With kindest regards and hoping you are keeping well,

Very sincerely yours,

Professor W. N. Boldyreff.

Pasteur Vallery-Radot.

Dr. John C. Hemmeter
739 University Parkway
Baltimore, Md.

Dec. 10, 1930.

Prof. W. N. Boldyreff,
Battle Creek, Michigan.

My dear Prof. Boldyreff:

Dr. Hemmeter is very ill, but accepts with pleasure the cooperation at a testimonial or Festschrift at Dr. J. H. Kellogg's eightieth birthday.

Very sincerely yours,

(Mrs.) Helene E. Hemmeter.

(A card mailed Mar. 17 from Mrs. Hemmeter)

In Memoriam

Dr. John C. Hemmeter

Born April the twenty-fifth, 1863

Died February the twenty-fifth, 1931

Baltimore, Maryland

Prof. Dr. R. Bárány

Upsala, 12, Jan., 1931.

Dear Professor Boldyreff:

I remember with pleasure my visit to the Battle Creek Sanitarium and the kindness with which Dr. Kellogg received me, his interest in science and his ~~A~~ many children.

If you find it can do any good, I am also agreeing if you put my name among the headletters of the organization committee, but I do not know anybody whom I could suggest to take part in this celebration, as I do not remember who of my colleagues has been in Battle Creek.

As to the article, I think that I will be able to send you one for the volume dedicated to Dr. Kellogg.

Many thanks for your kind wishes, which I heartily return.

Very sincerely yours,

R. Bárány.

Genova, li Gennaio, 1930.
Viale Benedetto XV, N. 8
Telefono 32-063
IX E.F.

R. Università di Genova

Instituto
Di Farmacologia e Terapia
Sperimentale

Il Direttore

Dear Professor:

In order to your kind favor on the 14
December last, I am glad to inform you that I
shall have the honor to participate to the jubilee
that you celebrate in the 80th year of your Chief
Director, John Harvey Kellogg.

I shall send you an article to be published
in the volume dedicated to Dr. J. H. Kellogg.

I thank you very much for having thought of
me on this occasion.

Very sincerely yours,

A. Benedicenti.

(Prof. A. Benedicenti,
Director of the Institute of
Pharmacology, to the University
of Genoa, Italy).

Such is the engaging title of a magazine just started in Paris. Its purpose is "to strive energetically against the effects of old age." If it can show how to do that, it can be sure of an unparalleled circulation; but no great third wave of hope and rapture can be churned up from its offer of a prize to a work whose author shall have given "proof of vigorous optimism and beautiful faith in life." For years after the war, pessimism and disbelief in life were carefully cultivated by literary "youth." If the apostles of gloom accompanied with reckless enjoyment were representative as they posed of their generation, the young were and are old; and it might fairly be assumed that the old were and are young.

Le Temps, curiously unconscious of its name, solemnly says:

No longer do we wish to grow old.

This secret hope, this desire touching by dint of its fervor, can be read on so many faces.

When did people want to grow old? It is true that many aging men and women try to resist Time or hide from him by being more active in habit and spruce of clothes and appearance; but this little bit of acting doesn't deceive them any more than it does that old rascal. Exercise, too often carried beyond the limit of moderation, may be as injurious as the want of it. Too many oldsters forget Mr. EVARTS'S receipt. He attributed his good health and long life to his complete avoidance of exercise. There is, indeed, a vigorous race of gray golfers, but they can have no expectation of staying young. The old lose much, but they also have gained much. They have learned, or should have learned, to take things as they come, to be tolerant. If they have little to hope, they have little to fear. In an ocean of noise a little isle of quiet is welcome. In an unintelligible world they have at least lived long enough to be a little more "noticing" than they were as children.

If their lot, tossing about in the urn, is fated to come forth sooner than that of most of those around them, why should they bother about their booking in Charon's skiff for everlasting exile? There is a time for everything. Why should one want to "stay young" or stay old—especially the latter? In South Serbia the other day STOYAN and YELKA DIMITRIYEVITCH celebrated the hundredth anniversary of their wedding. "I have three times grown teeth," says YELKA. She is 119, STOYAN 123. He is "a great talker," she says rather in admiration than in pain. Hasn't he had time enough to express the thoughts that arise in him? On the other hand, his love of tobacco and Rakita, the brandy of the country, may keep him alive much longer. Perhaps he is entitled to stay old.

Along The Pacific Coast

CO-OPERATIVE MARKETING By Knight Percy

Standardization of grades removes the gambling element from the buying and permits sale at a higher price. In your own buying you are usually willing to pay a premium for a standardized product. You buy a certain brand of coffee because experience has shown you that this brand is uniform in quality. Your grocer may offer you a cheaper coffee that he claims to be just as good but you insist upon receiving the known brand. You know that in many cases the cheaper coffee is as good but in other cases it is not and you pay a premium for the known brand or grade rather than take a chance on the other. The jobber buying large quantities of nuts uses the same line of reasoning in his buying that you do in buying your coffee. He is willing to pay a premium for a standardized product.

The few larger growers in the Northwest who are now producing nuts in any considerable quantity have their own grading systems that seem to be satisfactory to themselves and their customers. It is these same growers however that seem to be the greatest boosters for a standardized system of grades for the whole output of this section. They realize that within a few years marketing conditions will change. While there are probably considerably less than a hundred tons of nuts produced in the Northwest at present, within five or six years there will be a production of 2000 to 2500 tons. The California output is increasing annually; so is their almond output. The south will soon be flooding the markets with pecans. All of this means an increasing competition which our walnuts must meet.

The smaller grower, the fellow who sells but a few sacks, makes but little attempt at grading and often but little effort to wash and cure the nuts. It is most often from these small growers that the dirty, ungraded, blight specked, half cured nuts that we occasionally see in the stores are most likely to come. The customer who buys nuts of this description once will not be likely to call for Oregon nuts a second time, but instead will buy the graded California product or even the Manchurians. Thus our home markets which should be the most profitable owing to the lowest freight rates and selling expenses are gradually being closed to the home grown nuts.

Blaming these growers for putting out this type of product will not eliminate it from the market. We will have to make it more easy for them to grade their nuts and teach them to properly harvest and cure them. Some sort of marketing organization is necessary that this may be brought about; one that will grade the nuts for these people who have too small an output to justify their putting in a grader, and which will sell for them to an advantage and which will force proper harvesting and curing methods by refusing to handle products that do not come up to certain standards.

At present the term "Oregon Walnuts"

means little to the trade. In some instances it means large, well grown, well cured, well graded nuts, and in others it means a mixture of all sizes in one lot, half washed and in many with kernels mouldy, due to improper curing. Certain growers are receiving a fancy price for Oregon nuts, but we should not fool ourselves into believing these prices will be maintained under changing conditions unless we get together early in the game and plan to eliminate those conditions that will go towards reducing the demand and price for Oregon nuts. The price that we will receive for our nuts when we really begin to produce any quantity will depend upon how our product compares with that of California, grade for grade, and upon the form and strength of our selling organization or organizations. Buyers are not going to buy Oregon nuts simply because they are Oregon nuts. They will buy because of their merits compared with those of our nuts of other sections and a powerful marketing organization will be needed to see that these merits are recognized and paid for.

Sooner or later we walnut growers will be compelled to organize. If we are to take advantage of the lessons taught by the other Western horticultural industries we will not long delay taking the first steps in this direction. Study the history of the California citrus growers, it is similar to those of other fruit and nut growers and is similar to what ours may be if we delay organizing until we are forced to it. The citrus orchards at the start were very profitable. As plantings increased and marketing problems became more complex, the profits decreased until there came a period of lean years when their orchards were run at a loss. Many growers lost their places, and others grubbed out their trees. Then the idea of co-operation began to spread. The growers began to organize. Some of the organizations lived, others were killed by commission men and by the petty jealousies of members themselves. In some districts two or three associations were formed before one was able to live and grow. Finally three small associations which were competing against one another, came together in one statewide organization, called the "California Citrus Exchange." This exchange does millions of dollars worth of business annually. It is marketing over 30,000 cars of fruit each year at a good profit to the growers, whereas a few years ago when the state's production was only a 1000 cars, the ruinous prices received were believed to be due to over production. The history of the almond and walnut growers of California is a similar one. In each case co-operative organization was resorted to only as a last resort after the industry had been through a series of lean years. In none of these cases did the organizations have the opportunity of growing up with the industry. Instead the officials of these associations had to market large crops from the very start. They had to sell on a market that was badly demoralized and were bucked from the start by or-

ganized buyers and speculators who resorted to every means possible to break up the new associations. They had to sell a product that was not standardized in grading and they did not receive the support that they should have had from their own members. The speculators never lost a chance to poison the minds of those who would listen to them.

Our lesson, gained from a study of the development of the organizations, is that we should organize while our industry is in its infancy and thus allow our organization to grow as the production increases. Thus the mistakes that we make will be less costly and we will have a better opportunity of avoiding the period of lean years that has occurred in the development of every other large horticultural industry in the West.

The California growers made many mistakes that we should be able to avoid since they have pioneered the way for us. They allowed themselves to become crowded between the devil and the deep blue sea before they organized. They gave all their thought to production and none to distribution and selling. They distributed their crops poorly as unorganized growers always do, and blamed the poor prices received to over production. They cursed the middleman and speculator; but, regardless of the cursing, the gentlemen remained with the growers until the latter took upon themselves to perform for themselves certain services which they had long permitted the former to perform for them. They found that until the grower arranged to finance his own business he must expect to pay others for doing it for him and they do it for him and are always in a position to draw down a good share of the selling price for these services.

The middleman and the speculator will be with the grower until he is able to store and hold his crops until the market wants them and is able to distribute them himself. The only way in which the growers can do this is to reorganize, for as individuals the growers are unable to do certain things that are economically essential.

The average grower is not able to grade and inspect his own product. His freight is excessive as he cannot ship in carlots. His business is not extensive enough to warrant his going to any great expense to secure reliable data concerning market conditions. The buyers have this information. He is not able to conduct an advertising campaign which is often necessary to market his product to advantage. Working as individuals the growers cannot develop an efficient marketing system, but organized into a cooperative association they can do big things for themselves as has been demonstrated by the almond, citrus, raisin and walnut growers of California.

A cooperative marketing organization could do many things for our industry. It would help to protect our markets from injury done them by dumping inferior, improperly prepared nuts on them by making it worth while for the grower to market them through the association and by forcing his product to come up to definite standards before accepting it; it would enable us to offer a standardized product and to reduce

THE NEW WALNUT EHRHARDT

Prof. L. D. Batchelor, Riverside, Cal., recently referring to the new Persian walnut known as Ehrhardt, says that the nut is larger than the average Santa Barbara soft shell nut, requiring approximately 34 to 40 nuts to weigh a pound. It is broadly oval, base rounding, sometimes slightly pointed, apex, rather blunt. Suture shallow. Flange rather prominent. The surface is medium to smooth; the color medium light brown. Nuts are well sealed at both ends when properly handled at harvest season; the kernels are readily cracked out whole.

The kernel is plump and well-developed, usually of a light tan color. Good market type, averaging practically 50 per cent. of the total weight of the nuts. The flavor is mild, pleasant and free from any decided character.

The tree is quite early, about the same season as Placentia. Growth is vigorous, typical of this class of nut tree, producing a large amount of lateral twigs. The foliage is dense. The harvest season is medium to early.

The tree is a very early producer; apparently this is second to none. There are 38 of the original planting on Mr. Ehrhardt's property at the present time; their yields for the past three years are as follows:

Thirty-eight Ehrhardt trees yielded in their tenth season (1915) 80 lbs. per tree.

Thirty-eight Ehrhardt trees yielded in their eleventh season (1916) 75.5 lbs. per tree.

Thirty-eight Ehrhardt trees yielded in their twelfth season (1917) 79 lbs. per tree.

During the past three seasons, this variety has blighted to a very small degree every year. The writer has never observed over 5 per cent blighted nuts on the trees at any time during frequent visits to the grove. Meanwhile, seedling trees and the Placentia have shown as high as 65 per cent blighted nuts on the same or adjoining property.

Although this variety may not always continue to make such a good record for productivity and freedom from blight, nevertheless the past three years seem to warrant its commercial trial, especially under soil and climatic conditions which are similar to Santa Ana.

In order to measure the commercial worth of the Ehrhardt variety, it is being propagated and tested in several places by the University of California Citrus Experiment Station.

1. During the spring of 1917, five nine-year-old black walnut trees were top-grafted to each of the three varieties, Placentia, Eureka, and Ehrhardt. The above trees are located on the University trial grounds at the Whittier State School. The scions made a satisfactory growth of ten or twelve feet during the past season, so the trees already have a top equal to normal four-year-old orchard trees.

2. Eight seedling walnut trees are being top-grafted to the above varieties the current season in the Bardsdale district, on the property of Mr. L. F. Loyd.

3. Nursery trees of the three varieties are being grafted the present season, for planting in orchard form in 1919.

In testing the Ehrhardt variety it will therefore be compared with the two leading commercial varieties of the present time, namely, the Placentia and Eureka. Unless it proves equal or superior to these standard sorts, there is little or nothing to be gained by its propagation. From the short observation of the past three years, the Ehrhardt is a most productive and thus possibly a more profitable nut to produce than either of the other varieties.

A SAFE FOOD SUBSTITUTE

IF NUTS are to be granted the place of a staple in our list of food supplies, will it be safe to accept them as a substitute for flesh foods?

Beefsteak has become almost a fetish with many people; but the experiments of Chittenden and others have demonstrated that the amount of protein needed by the body daily is so small that it is scarcely possible to arrange a bill of fare to include flesh foods without making the protein intake excessive. This is because the ordinary foodstuffs other than meat contain a sufficient amount of protein to meet the needs of the body. Nuts present their protein in combination with so large a proportion of easily digestible fat that there is comparatively little danger of getting an excess.

It is also worthy of note that the protein of nuts is superior in quality to that of grains and vegetables. The critically careful analyses made in recent years have shown that the proteins of nuts, at least of a number of them, contain all the elements needed for building up complete body proteins; in other words, nuts furnish perfect proteins, which are not supplied so abundantly by any other vegetable product.

This fact places the nut in an exceedingly important position as a foodstuff. In face of vanishing meat supplies it is most comforting to know that meats of all sorts may be safely replaced by nuts not only without loss, but with a decided gain.—DR. J. H. KELLOGG.

An Illinois paper last month said: "Mrs. Chris. Bauer, of Mounds, Ill., who is visiting her parents here, yesterday showed us some whopping pecans, raised in their six acre pecan orchard down in Louisiana. They make our pecans "look like 30 cents." They measure about an inch in diameter and are about two inches long. She said the sample she brought us was under average size."

We never see, taste or hear of one of those big pecans without remembering the difference in flavor and quality between it and one of the many varieties of smaller nuts, North or South, and the statement by the U. S. Nut Culturist, C. A. Reed, that the high flavor of the northern grown pecan must be taken fully into account when considering possibilities of the large southern pecan.

A Promising Tropical Nut

United States Department of Agriculture
States Relations Service

Office of Experiment Stations

Hawaii Agricultural Experiment Station,
Honolulu, Hawaii, April 4, 1918.

Dr. Wm. C. Deming, Secretary

Northern Nut Growers' Association,
Georgetown, Connecticut.

Dear Sir: Mr. J. M. Westgate, Agronomist of this station, has referred me to your circular addressed "To Commissioners of Agriculture, Directors of Agriculture Experiment Stations, State Horticulturists and Others."

I am interested in the work which you are promoting and it may be of interest to you to know of one of the nut projects which we are carrying on here. The Australian nut, *Macadamia ternifolia*, proves to be one of the promising nuts for the tropics. It bears quite freely, the tree appears to be quite vigorous and free from serious pests. The nut is highly nutritious and pleasant to the taste. We have distributed a large number of seedlings of this and hope to be able to get some one interested in planting an orchard as a trial. The chief drawback of the nut is the extremely hard shell. If some seedlings can be found that are soft shelled or if it can be crossed with some soft-shelled relative so as to overcome this difficulty, it would certainly become an important commercial nut in the tropics.

Of course coconut is the king of all nuts and is strictly tropical. Hawaii is just on the edge of possible coconut culture and produces a small quantity of these nuts.

J. E. HIGGINS, Horticulturist.

Walnut Conditions In France

The special representative of the California Walnut Growers' Association recently wrote that between January 1st and February 10th this year there were exports to the United States from the Grenoble district in France 80,000 pounds of walnuts in shell, valued at \$13,782 and 120,000 pounds shelled, valued at \$52,209.50. He says that many producers are employing their nuts this year for the making of oil instead of marketing them as they usually do, in normal times. They are encouraged to adopt this means of disposing of their output in view of the fact that olive oil now commands excessively high prices, 45c per pound.

"Indeed, I know that some crackers have imported small nuts from the Bordeaux region for their needs. Others hereabouts have been trying to do the same but find it difficult to receive the goods ordered owing to limited transport facilities.

"It is not uncommon in normal years for 50,000 to 60,000 cases of halves to be shipped from Grenoble to the United States. I doubt whether more than from 8,000 to 10,000 cases (55 pounds per case) will go forward this year. In my opinion 50c a pound delivered New York is exorbitant for even the finest quality of Mayette halves, and shellers are talking of still higher prices in the near future."

American Nut Journal



COVERING NUT CULTURE
NORTH—SOUTH—EAST—WEST

AMERICAN FRUITS PUBLISHING CO., INC
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RALPH T. OLCOTT, Editor and Manager

Official Journal Northern Nut Growers' Assn

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ROCHESTER, N. Y., MAY, 1918



THE HIGH VALUE OF THE NUT

TO extend knowledge of the food value of nuts and encourage active interest in the subject, important articles from the "American Nut Journal" have been reproduced in a 24-page illustrated brochure under the title of

AMERICAN NUT CULTURE

A Survey of the Newest and Most Interesting Branch of Horticulture

A limited edition at 10 cents per copy is now available. In lots of 100 or more at special rate. It may be used singly or in quantity as propaganda for extending interest in Nut Culture, all sections of the country being covered in the subject matter. It includes the remarkable exposition by Dr. J. H. Kellogg, entitled "The Advent of Nuts Into the Nation's List of Staple Foods." It is intended particularly for those who do not yet realize that

A LUXURY IS BECOMING A POPULAR FOOD

and it preserves in convenient form matter which all nut growers will wish to have at hand.

American Fruits Publishing Co., Inc.,
39 State Street, Rochester, N. Y.

AID FOR THE NUT GROWER

One of the most valuable publications recently laid on our desk is Buletin 49 of the Georgia State Board of Entomology, treating of pecan insects, by William F. Turner; pecan scab, by C. S. Spooner, and pecan diseases other than scab, by C. G. Crittenden.

Before entering upon a description of a somewhat formidable list of insects and diseases, the authors unite in this reassuring foreword:

"Pecan growing is rapidly becoming one of the most important industries of south Georgia and in recent years more and more plantings have been made in the central and even northern portions of the state. At present thousands of acres have been set out to pecans through south Georgia and these plantings are being increased yearly. As a result the growers are already deeply interested in the insects and diseases which attack the pecan, and these pests are of continually increasing importance as the capital which is invested in the business increases.

"The present bulletin is not intended to give exhaustive reports on the life histories of the various insects and diseases which attack the pecan. In fact, workers have been engaged in the study of the insects for such a short time that there are very few of them whose life histories are thoroughly known yet. This is also true, though perhaps in less degree, of the diseases.

"In view of the numerous requests which are constantly being received for information concerning these matters, it was felt that the situation could best be met by a publication giving a general survey of the field. In the present bulletin, therefore, an attempt has been made to furnish the pecan growers with a guide by which they may become familiar with the insects and diseases which are now injurious, or which may become so, and may further become familiar with the principal methods of control.

"It should be borne in mind that, although many insects are dealt with in the bulletin, probably only a few of them will ultimately be looked upon as serious pests of the pecan. In this connection it is well to call to mind that many fruits, for instance apples, have as many or even more species of insects attacking them. Yet under ordinary conditions the grower has to contend with not more than three or four. Without doubt this will ultimately be found to be the case with the pecan, also. Those insects which are most injurious at the present time have been indicated, as have those which seem to possess habits and characteristics which may cause them to become of serious importance later.

"With regard to some insects, at least, it has already been proven that successful, commercial pecan culture must include the spraying of the trees. At first this seems a big item—something special which must be done. If the grower, however, will simply include spraying in his list of the year's operations, expecting to spray his trees at a certain time, just as he expects to plow at certain periods, he will soon find that the matter adjusts itself naturally, and quickly becomes as little of a bugbear as planting or cultivating."

WILLARD G. BIXBY, ACTING SECRETARY

Dr. William C. Deming, Georgetown, Conn., secretary of the Northern Nut Growers Association, as announced in a recent issue of the JOURNAL, has been commissioned a Captain in the medical corps of the army. Last month he was called into active service and responded immediately. He hurriedly turned over the affairs of the secretaryship to Willard G. Bixby, 46th street and Second Avenue, Brooklyn, N. Y., for attention until more permanent arrangements can be made, at the same time notifying President W. C. Reed of his action.

The best wishes of hundreds of friends of Dr. Deming will go with him in his work for the country. There is a great demand for doctors' services in military circles.

The Northern Association is fortunate in having available the services of Mr. Bixby who is one of the most earnest and active members and whose practical aid in Association matters has been appreciated repeatedly. Those having business of any kind with the secretary's office should communicate with him at the address given above.

As has often pointed out in these columns, one cannot expect to grow nut trees with entire immunity from the obstacles which beset the production of any commodity from the earth. The spirit in which this bulletin has been put forth, no less than the valuable matter it contains, is highly commendable. It shows admirably the present day tendency of those in positions of authority to co-operate with those who are earnestly endeavoring to produce.

WALNUT TREES IN EASTERN STATES

Benjamin Buckman, Farmingdale, Ill., expresses interest in the fact that considerable numbers of fine bearing English walnut trees have been located throughout the states bordering on the Great Lakes, in Canada and in Pennsylvania. He suggests that some description of these trees be given. This will be done, although from time to time the Journal has referred to some of these trees in detail. On this subject J. F. Jones, Lancaster, Pa., says: "On a motor trip through Western New York and Ontario in September 1915, we saw several fine bearing trees of hardy French walnuts. At St. Catharines, Ont., we saw a fine tree of the Franquette which was bearing a very heavy crop of fine walnuts. There is also a fine tree of Franquette growing on John Garretson's farm in Adams County, Pa. This tree was grafted upon black walnut by Mr. Garretson's father nineteen years ago with scions obtained from California. It bears good and regular crops of fine walnuts. The Franquette and Mayette are fully as hardy in the eastern states as any that we have. The Mayette has borne in Pennsylvania and the nuts are as large and fine as those of this variety in California, and equal to any walnuts ever grown in Pennsylvania."

Wendell P. Williams, Dansville, Iowa, a member of the Northern Nut Growers' Association and an enthusiastic nut grower, died recently at Camp Cody, New Mexico.

Filbert Plantation For Experimental Orchards

As announced in a recent issue of the *Journal* the Northern Nut Growers' Association has established an experimental station for the testing of nut trees, at May Apple Farm, Stamford, Conn. Conrad Vollertsen and James G. McGlennon, Roches-ter, N. Y., specialists in filbert culture, have sent a plantation of filberts to be tried out at this station. Correspondence relating thereto, of interest to nut growers, is as follows:

Rochester, N. Y., April 10, 1918.

Dr. Wm. C. Deming,
Georgetown, Conn.

Answering your letter of the 28th, we believe it will be better to plant the filberts in a solid block rather than distributed over the three acre orchard as fillers. It is an open question in my estimation, Doctor, and I believe in Mr. Vollertsen's too, as to whether the filbert used as a filler is desirable. Personally I am strong for "one thing at a time and that done well, etc., etc." In the Albany, Georgia, section, some of the pecan companies believe that other fruit bearing trees, peaches for instances, can be successfully developed as fillers without detriment to pecans. It seems to me that any filler crop consumes no little nutriment that the principal crop would be benefited by having.

Mr. Vollertsen has suggested that he might set out filberts in his pecan grove at Albany. Personally, I shall hold to the policy of setting out filberts as a filbert planting solely and exclusively.

Answering your letter of the 26th ult., will say that Mr. Vollertsen and I shall do everything we can to make the filbert department of the joint convention of the Northern Nut Growers' Association with the National Nut Growers' Association at Albany, Ga., the last two days of October and the first day of November an unqualified success. We will both be there and prepared to tell what we have done in our experiments with filbert growing here. Mr. Vollertsen will be prepared to answer, I believe, satisfactorily any and all inquiries that will be made to him on the subject, as he is a man past sixty years of age, coming to this country from Germany in his 21st year and his entire working experience in Germany was in a nursery. That nursery raises a great many filbert plants and also, as I understand him, fruited them very successfully. He is a man of decidedly retiring disposition but when once warmed up on his subject he disseminates wonderful information. He has been most successful in this city and in other parts of the state as a horticulturist and landscape architect. I shall probably have to put a bomb under him and actually blow him up to the talking point at the convention, but that is what I am going to do, because the man possesses a fund of information on the subject of filbert culture that should be widely disseminated.

We shall take plants of four different grades with us and samples of all our varieties and too, we hope to be able to take with

us a supply of nuts to be handed out for consumption.

We do not know how far south the hazel grows and fruits successfully, but Mr. Vollertsen is endeavoring to determine this. There is a rapidly growing sentiment in favor of nuts as food and we believe that the filbert will prove to be one of the most acceptable nuts as food for man.

I expect that several of my pecan clients will go with me to the convention.

I believe that there are just as great possibilities in this section and doubtless in many others in the North for the improved walnut and filbert as has been proven for the improved varieties of pecan in the South, and I believe that the time is not far removed when extensive filbert and walnut commercial plantings will be made in this "neck o' the woods." I constantly urge the desirability of making such plantings here.

I am very glad that the Northern Nut Growers' decided to meet in convention with the National Nut Growers at Albany this fall and believe that it will do more than any other thing that could have been done to stimulate interest in nut culture in the North. I congratulate you, Doctor, on your foresight and wisdom in contributing so liberally to such arrangement.

JAMES S. MCGLENNON.

April 10, 1918.

Mr. Paul M. Barrows,

May Apple Farm, Stamford, Conn.

My Dear Mr. Barrows: My esteemed friend and collaborator in our filbert experimental work, Conrad Vollertsen, called at my office this morning to inform me that he dug and packed yesterday, twelve selected plants of our twelve best varieties and I understand him to say that the shipment would go forward to you to-day by prepaid express. He, however, will likely advise you when the shipment goes forward.

We finally decided to send you twelve varieties instead of ten. I trust that the shipment will reach you promptly and in satisfactory condition. I believe you will agree that the plants are nice plants. We know that they will be very carefully set out and given the best of care and attention, but if any should die or fail to give entire satisfaction we shall replace them next fall or next spring as you consider best.

We advise that these plants be set in a tract by themselves and twelve feet apart to insure what we believe will be thorough pollenization, although we have had them pollenize most satisfactorily at a considerably greater distance than this, but twelve feet apart is the distance we have decided to recommend. We are growing our plants in a sandy loam. Before we acquired this land it was just ordinary farm land. We wish it were a little better drained and therefore we advise that filberts be planted in a well drained sandy loam. They should not be planted in a shaded position, although we advise that a break of the prevailing wind be developed.

We are using the common willow for this purpose. If the soil where these plants are set is a good soil, we believe that the ordinary fertilizer will be sufficient. Liberal fertilization seems to make for too great wood growth and therefore nut crop is depleted.

We want to give you any and all the information we can, because we want to do anything and everything we can to the end that the Vollertsen-McGlennon filbert patch of the Northern Nut Growers' Association at May Apple Farm will be an unqualified success.

I may call on you the latter part of May or early June, as I expect to be in New York on my way back from Albany, Georgia, for which place I expect to leave about the 10th or 15th of May.

Mr. Vollertsen informs me that he has labelled each plant carefully and has copied from the original designation of same which accompanied the shipment of the original plants from Germany six years ago.

Be assured that any further inquiries you may desire to make of either Mr. Vollertsen or myself in relation to our contribution will be answered promptly and to the best of our ability.

JAMES S. MCGLENNON.

Don't Plant Seedlings

Editor *American Nut Journal*:

I see friend Buckman seems to think that it is all right to plant seedling chestnut trees, giving Mr. Endicott, the originator of Boone, as authority for same. I think I was in closer touch with Mr. Endicott than was Mr. Buckman, and I want to say that while at one time Mr. Endicott was of the opinion that the Boone would reproduce fairly well from seed, he later found that such was not the case, as of hundreds of seedlings of Boone fruited by him not one was equal to Boone.

I have just received a letter from Mr. Endicott's son, who has his father's place, in which he says that he has an orchard of Boone seedling trees, and of the 125 trees all of which have fruited, only about twelve are fairly good and all the rest he proposes to graft over to Boone.

My own experience is the same. I have fruited many Boone seedling trees, but not one is as good as the parent. Only a few are good enough not to need to be grafted to something else.

Don't plant seedling chestnut or any other nut with the expectation of getting them to produce nuts like the parent. It's a delusion.

E. A. RIEHL.
Godfrey, Ill.

The nut should no longer be considered a table luxury. It should become a staple article of food and may most profitably replace the pork and meats of various sorts which are inferior foods and are recognized as prolific sources of disease.—DR. J. H. KELLOGG.

Just mention AMERICAN NUT JOURNAL.

AMERICAN NUT JOURNAL---MAY, 1918

EDITORIAL DEPARTMENT—Communications on any subject connected with Nut Growing and Distribution are cordially invited by the editor; also articles on this subject. We shall be pleased to reproduce photographs of trees of interest, methods and scenes connected with the Nut Industry; portraits of individuals, etc. Suggestions are cordially welcomed.

ADVERTISING—Advertising forms close on the 28th of each month. If proofs are wanted, copy should be in hand on the 15th. Advertising rate: 15 cents per agate line; \$2.10 per column inch for any amount of space.

Advertisements that do not represent reliable concerns will not be accepted.

SUBSCRIPTIONS—The "American Nut Journal" will be sent to any address in the United States for \$1.25 a year; to Canada or abroad for \$1.75 a year.

Add ten cents for exchange unless bank draft, express or postal money order is used.

WHAT THIS JOURNAL STANDS FOR—Reliable information on all phases of the Nut Industry. It is for the advancement of Nut Growing in general; it is in no way confined to the interest of a particular kind of nuts, nor of a particular section. It is broad in scope and absolutely independent. The aim of "The American Nut Journal" is to stimulate thousands of persons into developing interest in one of the greatest food supplies of the future—to line the roadsides and fill the waste places with trees of a sort which yield dollars worth of fruit every year instead of the mere bunches of leaves resulting from present shade and ornamental planting. At the same time it will record the progress of the industry, the latest descriptions in the note book of the biologist and plant physiologist, the rapidly expanding knowledge of methods, the increasing acreage, and in short the news as it develops of an industry whose importance is recognized by an increasing number of persons in all sections.

AMERICAN FRUITS PUBLISHING COMPANY, Inc.

Ralph T. Olcott, Editor and Manager 121-123-125 Ellwanger & Barry Bldg. Rochester, N. Y.

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IMPORTS OF NUTS INTO THE UNITED STATES, FOR CONSUMPTION, IN FISCAL YEARS ENDING JUNE 30, 1905-1917.
(Compiled from Commerce and Navigation, Department of Commerce, Especially for the "American Nut Journal.")

KIND	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916	1917
Almonds—not shelled.....lbs.	5,542,246	6,119,301	5,714,207	8,515,688	2,120,632	6,810,056	3,762,654	5,242,563	2,363,860	5,501,059	4,684,598	2,368,369	4,901,160
Shelled.....lbs.	6,523,228	8,299,035	8,717,962	8,556,162	8,538,054	10,495,750	12,160,636	11,692,988	12,655,057	13,896,621	12,168,153	13,210,668	19,160,258
Apricots and peach kernels lbs.						27,854	13,551	7,939	18,769	18,572	67,164	11,926	250,075
Coconuts in the shell...Dollars	\$1,102,112	\$1,299,322	\$1,349,380	\$1,439,589	\$1,246,463	\$1,298,970	\$1,704,262	\$2,012,203	\$1,793,713	\$2,150,500	\$1,593,666	\$1,891,328	\$2,583,560
Coconut Meat broken or Copra not shredded, desiccated or prepared.....lbs.	15,893,260	12,100,822	7,064,559	14,121,576	23,742,518	20,890,539	38,081,984	64,506,787	34,283,592	44,459,158	88,690,382	108,507,765	247,043,127
Desiccated, shredded, cut or similarly prepared.....lbs.	3,116,620	3,922,762	3,476,698	5,584,652	5,461,602	5,985,308	6,661,850	5,396,465	6,826,095	9,307,924	5,866,806	7,947,380	10,491,796
Cream and Brazil.....bu.	277,686	241,789	280,633	310,418	409,644	461,496	277,679	21,601,008	11,933,139	11,431,531	12,483,319	12,489,217	16,233,023
Filberts—not shelled.....lbs.	6,669,857	13,414,887	9,960,280	8,997,246	7,365,837	10,026,961	10,084,987	8,375,860	8,586,278	10,836,072	10,922,248	10,063,552	10,663,201
Shelled.....lbs.	915,227	1,155,734	1,553,332	1,343,594	1,384,689	1,413,391	2,332,606	1,368,835	1,450,620	1,798,147	1,722,705	1,259,540	1,901,688
Marrons, crude.....lbs.						10,270,398	9,968,879	14,845,345	10,157,321	18,849,257	12,549,959	15,754,796	6,275,030
Olive nuts, ground.....Dollars	\$14,851	\$13,057	\$1,016	\$1,027	\$580	\$478	\$236	\$206	\$342	\$385	\$25	\$112	\$420
Palm and Palm Nut Kernels "	\$1,839	\$3,573	\$3,350	\$2,250	\$2,752	\$6,907	\$5,744	\$7,970	\$4,872	23,127	31,900	1,104,885	626,436
Peanuts or Ground Beans.....													
Unshelled.....lbs.	3,404,557	2,325,259	10,432,828	6,498,202	7,326,371	11,397,172	11,055,823	12,660,433	12,140,612	17,298,778	14,075,387	9,623,411	7,710,082
Shelled.....lbs.	1,935,260	704,978	4,780,054	1,775,946	1,302,919	16,089,919	7,821,505	3,127,829	7,823,173	21,819,101	11,695,507	19,739,888	27,548,928
Pecans.....lbs.				1,118,071	1,480,289	3,349,460	2,333,037	2,607,227	1,803,434	2,621,161	2,032,539	1,265,382	4,076,933
Walnuts—not shelled.....lbs.	16,312,138	15,029,724	23,036,646	21,427,853	17,432,885	23,269,974	21,146,116	22,208,845	16,363,046	16,134,211	20,988,326	22,610,418	26,709,971
Shelled.....lbs.	4,178,010	4,948,175	7,199,988	7,098,958	8,781,908	10,960,988	11,244,054	10,713,286	10,093,622	11,636,053	10,552,956	13,445,790	13,706,614
All other shelled or unshelled, not specially listed.....lbs.	7,872,930	9,412,877	10,598,186	10,441,327	9,938,337	3,584,544	2,962,663	3,050,989	3,600,056	7,426,313	3,272,492	2,772,589	2,769,631
Total of nuts imported Dollars	\$6,154,515	\$7,228,607	\$9,315,891	\$9,563,742	\$8,549,997	\$12,775,196	\$14,265,572	\$15,626,485	\$13,508,307	\$19,815,713	\$16,865,244	\$20,594,434	\$33,667,684

a—pounds.

Nut Culture Information

Reprint folders on topics discussed in American Nut Journal. 10 Cents Each

- Grafting and Budding the Walnut—As advocated by the United States Department of Agriculture.
- Pecan Areas of the United States—Limits within which the Pecan may be profitably grown. By M. P. Reed.
- Walnut Trees For New England—Dr. Robert T. Morris.
- Some Walnut Varieties—Dr. L. D. Batchelor.
- Chip Buds For Nut Trees—Charles L. Edwards.
- Grafting, Budding, Topworking—Dr. W. C. Deming.
- Breeding Chestnuts For Disease Control—United States Department of Agriculture.
- Pecans As An Investment—Herman C. Locke.
- Underworking Nut Trees—Charles L. Edwards.

- The Ubiquitous Black Walnut—T. P. Littlepage.
- Value of Nuts As Food—Dr. W. C. Deming.
- Improved Black Walnut a Good Investment—Henry Stabler.
- Present Status of the Pecan Industry—C. A. Reed, U. S. Nut Culturist.
- Grafting Tardy Walnut Trees—Judge Charles L. McNary.
- Pecan Varieties for the South—C. A. Simpson.
- Sources of Supply of Hazel Nuts—Bulletin Imperial Institute.
- Top-Grafting the Walnut Tree—Ferd Groner.
- Black Walnut As a Meat Producer—Henry Stabler.
- Outline of Northern Nut Culture Activity—Dr. W. C. Deming.

Back numbers of "American Nut Journal" are scarce. The only way to secure this valuable record of the American Nut Industry is to see that your subscription is paid in advance. Three years for \$3.00.

AMERICAN FRUITS PUBLISHING CO., 39 State Street, Rochester, N. Y.

THE MAGIC OF AN ACRE OF WALNUT TREES

By DR. J. H. KELLOGG

The great economic importance of the encouragement of nut culture in every civilized land is best shown by comparing the amount of food which may be annually produced by an acre of land planted to nut trees and the same area devoted to the production of beef. I am credibly informed that two acres of land and two years are required to produce a steer weighing 600 pounds. The product of one acre for one year would be one-fourth as much, or 150 pounds of steer. The same land planted to walnut trees would produce, if I am correctly informed, an average of at least 100 pounds per tree per annum for the first twenty years. Forty trees to the acre would aggregate 4,000 pounds of nuts, or 1,000 pounds of walnut meats. The highest food value which could be ascribed to the 150 pounds of beef would be 150,000 calories or food units. The food value of the nut meats would be 3,000,000 calories, or twenty times as much food from the nut trees as from the fattened steer, and food of the same general character, protein and fat, but of superior quality.

An Income of \$10,000 Per Year

The planting of the improved varieties of the black walnut solves the problem of utilizing our waste land that cannot be cultivated. With meat growing scarcer and higher priced all the time, the demand for nuts is going to be far in excess of the supply in the future. "It is conservatively estimated," says J. F. Jones, "that if one plants, say, 1,000 trees of the improved varieties of the black walnut and gives them some attention till established, when in good bearing they will return a revenue of at least \$10.00 per tree in "nut meats" or \$10,000 a year. These trees need little or no attention and may be planted on rough land or along fences and ditches where it would not be practicable to plant trees requiring more attention. With the cracking machinery now being perfected, the work of cracking black walnuts and other nuts will be made easy in the future.

"E. A. Riehl, the noted Illinois nut and fruit grower, is the first to grow black walnuts to any appreciable extent on grafted trees. Mr. Riehl has a number of Thomas trees now in bearing. He wrote me in December, 1915, that he had sold all of the Thomas meats at 80 cents per lb., and as he got 10 lbs. of meats to the bushel of nuts. Thomas walnuts, he considered their growing very profitable.

"It does not require a very large black walnut trees to produce a bushel of nuts. Large trees may bear eight or ten bushels of nuts in a season."

One acre of walnut trees will produce every year food equal to:

14,000 lbs. red bass (a ship load).

3,000 lbs. beef, (five steers).

7,500 lbs. chicken broilers.

15,000 lbs. lobsters.

10,000 lbs. oysters.

60,000 eggs (5,000 dozen).

4,000 quarts milk.

A ton of mutton (13 sheep).

250,000 frogs.

And when one acre will do so much, think of the product of a million acres:

Ten times the product of all the fisheries of the country.

Half as much as all the poultry of the country.

One-seventh as much as all the beef produced.

More than twice the value of all the sheep.

Half as much as all the pork.

And many millions of acres may be thus utilized in nut culture.

And the walnut is not the only promising food tree. The hickory, the pecan, the butternut, the filbert and the pinon are all capable of producing equal or greater results.

NATION'S FOOD IN ONE PRODUCT

By Dr. J. H. Kellogg

A SINGLE acre of nut trees will produce protein enough to feed four persons a year and fat enough for twice that number of average persons. So 25,000,000 acres of nut trees would more than supply the whole people of the United States with their two most expensive food stuffs. Cereals and fresh vegetables, our cheapest foods, would be needed for the carbohydrate portion of the dietary. Just think of it. A little nut orchard 200 miles square supplying one-third enough food to feed one hundred million of citizens. The trouble is the frogs and cattle are eating up our food supplies. We feed a steer 100 pounds of food and get back only 2.8 pounds. If we plant 10 pounds of corn we get back 500 pounds. If we plant one walnut we get back in twenty harvests a ton of choicest food. In nut culture there is a treasury of wealth and health and national prosperity and safety that is at present little appreciated.

Here is a veritable treasury of wealth, a potential food supply which may save the world from any suggestion of hunger for centuries to come if properly utilized.

The Range of the Pecan

By J. F. JONES, Lancaster, Pa.

The pecan is the finest of our native American nuts and the most profitable to grow commercially. Unlike the other hickories, the pecan tree is of rapid growth and quickly makes a tree large enough to bear profitable crops of nuts. The improved varieties of the pecan sell for higher prices than any other nuts that reach our markets, the wholesale prices of the budded sorts running 45 to 65 cents per lb. and retailing as high as \$1.00 a pound. Some of the southern growers think the pecan can be grown profitably at 10 cents per lb., but the pecan being a native American nut and as yet little known, we have the world for a market and may reasonably expect the best budded sorts to sell for high prices for a good many years.

The pecan tree is the most cosmopolitan that we have, as regards its ability to adapt itself to various soils and climatic conditions. It is found growing naturally, as a forest tree, as far north as Davenport, Iowa, where the tree is sometimes exposed to winter temperatures of 40 degrees below zero, and from there in practically an unbroken chain along the Mississippi river, to the Gulf Coast, where the orange, fig and other sub-tropical fruits thrive. Its behavior on various soils is no less striking. The tree is growing and bearing good crops of pecans from the lower river bottoms which are occasionally flooded for several weeks at a time, up to at least 1500 feet elevation, and on practically all kinds of soil, from the clay and clay loams, to the lightest and poorest sandy soils.

Some of the finest and most productive northern varieties that have been discovered and which I am propagating by budding and grafting, have been found near the northern limit of the pecan's natural range, and as these trees will be unquestionably hardy and mature their fruit anywhere that our more common orchard fruits can be grown, the culture of that delicious and high priced nut can now be extended very profitably. The fruit of these northern varieties can and will compete very successfully with the best southern product. Some of the northern varieties bear nuts, under northern conditions, nearly as large as the best southern varieties, and the northern varieties selected for propagation are always well filled and of better quality than the large fruited varieties now grown in the lower south.

Every man who cuts down a timber tree should be required to plant a nut tree. A nut tree has a double value. It produces valuable timber and yields every year a rich harvest of food while it is growing.—
DR. J. H. KELLOGG.

What is *Your* Age?

Lecture Given to Sanitarium
Patients

By

D. H. KRESS, M. D.



1946

ORLANDO, FLORIDA

What is *Your* Age?

Someone, being asked, "How old are you?" replied, "Six thousand years." He no doubt felt like it. In reality that was his age. It is your age, and it is my age. As a race, we are six thousand years old, and our age is telling on us, for we today are suffering the results of our own sins and the accumulated results of our ancestors' sins.

Man, at the beginning, lived to the age of more than 900 years. Had not man been endowed with a degree of vitality to which we today are strangers, the human race would long ere this have been extinct.

The race is becoming weaker and more infirm. The century mark is now seldom reached. We age prematurely. Deaths from organic diseases are on the increase, and few reach the age of 100, 90, or even 80 years.

I hear someone say, but doctor, is it not true that the average age of life has greatly increased during the past half century? Yes, that is true, but while the average age of life has increased, the maximum age has decreased.

Dr. Haven Emerson, former health commissioner of New York City, tells us that "in the City of New York during fifty years the mortality from scarlet fever diminished 99 per cent, diphtheria 95 per cent, pulmonary tuberculosis 79 per cent, acute respiratory diseases 53 per cent." This looks most encouraging. It is an accomplishment of which we may justly be proud. But while the mortality in infancy and from germ diseases

diminished, he tells us that mortality from cancer during the same period "increased 176 per cent, from heart disease 187 per cent, from diseases of the arteries 663 per cent."

There are individuals here and there who have succeeded in living to the century mark. At the age of 99 years, Stephen Smith, one of the founders of the American Public Health Association, in addressing the members of the organization at their annual meeting in New York City, at a banquet given in his honor, said:

"Others were associated with me in the founding of this organization; but, like the servant of Job, I can say, 'I only am left alone to tell thee.'" All his former associates, he said, were more robust than was he, and should have been with him on the platform.

A young woman stepped up to him before he went onto the platform and asked, "Dr. Smith, how does it feel to be old?" to which he replied, "I don't know."

His advice to one who was anxious to learn the secret of his long and useful life was, "Take care of your stomach the first fifty years of your life, and the next fifty the stomach will take care of you." He himself did this. With him this was not a matter of choice, but of necessity, because he had by inheritance a frail constitution. In his address he expressed the hope of living to the age of 120 years; and, since he had a feeble and infirm constitution and succeeded in living to the age of nearly one hundred, he said he could see no reason why a robust person, liv-

ing as carefully as did he, should not live even longer than that, and why the expectancy of human life should not be raised above the popular expectancy of three-score years and ten.

Thomas Edison lived to an advanced age. Had he died early in life, it would have been chargeable to himself and not to his ancestors, for his great-great-grandfather lived past the century mark. His grandfather lived to the age of 103 years. To him were born seven children, all of whom lived to advanced ages. Samuel, the father of Thomas, reached the age of 97 years. His excellent heredity combined with careful living was responsible for the useful and long life of Edison. In speaking of himself, Edison said: "I keep my health by dieting. People eat too much and drink too much. Eating has become a habit with almost everyone. It is like taking morphine; the more you take, the more you want. People gorge themselves with rich foods, use up their time, ruin their digestion, and poison themselves." He added: "If the doctors would prescribe dieting instead of drugs, the ailments of normal man would disappear. Half the people are food drunk all the time. That is the secret of my health. I always live abstemiously. It is a religion with me."

Dr. Elliott, who for years was president of Harvard, and one of America's foremost scholars and educators, at the age of 80 said: "That I have borne much labor and responsibility without ever suffering even a temporary breakdown seems to me to be due, after

the inheritance of a sound constitution, to my possessing a good muscular and nervous system, preserved by open air exercise and the habit of moderate eating. This may have contributed to the fortunate result, and at no time of my life have I ever made habitual use of any nerve stimulant, like tea, coffee, tobacco, or alcohol."

Chauncey Depew, being interviewed by a reporter on his ninetieth birthday, when asked the secret of his usefulness at that advanced age, said: "If I have lived longer than others, it has been because I had the will to be wiser than others. Take eating—most people eat what they like. I eat only what likes me. There are many things that I like which I do not touch, and the result is that the machine works without my thinking of it. For thirty years I have made it a point to eat sparingly and to sleep seven and one-half hours out of the twenty-four."

Referring to his diet, he said that years ago he concluded that "beefsteak and butcher's meat figured too much in my diet. Out they went; never to return." His reforms went farther than this. He gave up the use of alcoholic beverages altogether and also tobacco.

Some men are older at forty than others are at sixty. A man of forty with sclerotic or hardened arteries is, in reality, from a medical standpoint, older than is the man of sixty whose arteries are still soft and elastic. It is not merely the arteries that undergo sclerotic changes in old age. The liver, the kidneys, the heart, the brain, the muscles, and even the bones undergo similar changes.

This hardening of the tissues determines the age of the individual. The number of years a person of fifty is capable of living may be determined by the condition of these structures.

When the tissues and organs of the body undergo these degenerative changes, they are no longer capable of functioning as in youth. Glands, which have to deal with the poisons that are introduced into the system or formed within it, are no longer capable of neutralizing or eliminating them perfectly. In time the function of these organs is interfered with to the extent that death results from the retention of poisons.

The length of time these organs are capable of functioning is determined before birth. Man can no more add to his years than he can add to his stature. He can, however, shorten the period of his earthly career. There are automobiles manufactured that are guaranteed to run 100,000 miles; others are ready for the scrap heap before half that distance is reached. They are made of poorer material, and are not so well built. The material composing them and the workmanship determines the length of time automobiles are capable of enduring. The automobile that is composed of the best material and is so well constructed that it can endure for 100,000 miles, if driven recklessly, especially at the beginning, may be on the scrap heap in a few years or months. In like manner, some possess a heredity that should enable them to live to the age of 100 years or even longer. Their parents and ancestors lived to a very old age.

Others, live as carefully as they may, cannot possibly pass the threescore years and ten. The age limit is predetermined.

Someone has said, "To live to the age of one hundred years it is necessary to develop a chronic disease early in life, and then take care of it," or possibly it may be necessary to be rejected by a first class life insurance company. The man who has a chronic ailment and knows it, gives attention, as a rule, to his habits of living. Living more carefully than the one who by heredity has robust health, he may outlive his boastful neighbor who affirms, "I can eat anything." For this reason it is the apparently robust who are as a rule cut off suddenly in life without remedy.

It is possible by careful living to be permeated with a feeling of well-being so that there will not exist the inclination to resort to the use of unnatural stimulants as tobacco, tea, coffee, and so forth, which the masses feel they must have to keep going. It is lowered vitality that calls for stimulation. Only subnormals feel the need of stimulants, but they, above all, should abstain from their use.

The fact that stimulants are so universally sought is in itself evidence that the human family is subnormal. It also affords the explanation why our boys and girls, because of this defective heredity, are becoming addicts of the cigarette and narcotics. Not much can be hoped for the future. The constantly increasing mortality from heart disease and other organic diseases will continue. To my mind we are in a fair way of

depopulation unless some very radical changes in the habits of our people are made speedily.

To improve the race physically and morally, thought must be given to wrong physical habits. A religion that does not direct attention to causes in the effort to get rid of results is of little or no permanent value. It is not enough to say, "Son, be of good cheer; thy sins be forgiven thee." To this must be added, "Sin no more, lest a worse thing come unto thee."

For additional copies of this tract send to:
D. H. KRESS, M. D., 405 Niblic Ave., Orlando

Price \$2.00 per 100

Suggestions as to

HOW, WHAT and WHEN TO EAT

1. Cheerfulness should be cultivated during the meal hour. "Never eat when mad or bad or sad, only when glad." "A merry heart doeth good like a medicine."

2. Contentment and simple foods form a happy and agreeable combination.

3. Animals thrive best on simple foods and few kinds, so will mankind.

4. Thoroughly masticate your food, and do not make a practice of eating freely of soft starchy foods.

5. Regularity of meals is essential. There should be an interval of at least five hours between meals, as a rule.

6. The evening meal should be light, and composed of foods that are easy of digestion.

7. Vegetables and fruits should not, as a rule, be eaten at the same meal.

8. Sugar and milk, or preparations in which they are combined, should not be used freely.

9. Cane sugar should be used sparingly.

10. Milk is a food, not a drink. Eat some food with it or else sip it slowly.

11. Acid or subacid fruits should not as a rule be eaten at the beginning of the meal, so as not to interfere with starch digestion.

12. A few minutes of rest and relaxation before meals, and cheerful moderate exercise after meals, has a beneficial influence on digestion.

13. The proteins of nuts, grains, legumes, and cottage cheese, are ample to meet the demands of the body.

14. Pepper, mustard and pickles are irritants, and should not be indulged in.

15. The use of hot foods or hot drinks tend to debilitate the mucous membrane of the throat and stomach.

16. Tea, coffee and cocoa are not compatible with the best of health. Nervousness and irritability are caused by their use.

17. Copious drinking, at meal time, or immediately after, should not be indulged in, especially by those who subsist largely upon starchy foods.

18. The best time to drink freely of water, is when the stomach is empty—at night before retiring, or in the morning soon after rising, or a half hour before meals.

19. Deep breathing improves the intro-abdominal circulation and the quality of the digestive juices secreted.

20. If the muscles of the abdomen are flabby, they should be developed by suitable exercise. If they cannot be developed, a suitable abdominal support may be worn with benefit.

21. Worry and discontent are an injury to the digestion.

22. A knowledge of right doing is one of the best aids to good digestion. "Whenever you are feeling blue, something for someone else go do."

23. Thoughts influence, favorably or unfavorably, the digestion, "whatsoever things are true, whatsoever things are honest, whatsoever things are lovely, whatsoever things are of good report; think on these things."

DANIEL H. KRESS, M. D.

405 Niblic Avenue

Orlando, Florida

ditures amounts to \$33,500. This monument which we are planning to erect in their honor will be worthy as you can judge by the pictures in this inclosure. Should we not all of us be willing to sacrifice if necessary to build this memorial? This beautiful church, lot, and furnishings will be worth at least \$120,000, but with our plan of working an evening shift five nights a week with donated labor, some of which has already been pledged, we can erect this church, we feel, more reasonably than that.

Your contribution placed in the return envelope may not seem like much to you, but the many dollars that will come in if "you" will help, if necessary, with even a small amount, will go a long way in helping to build this fitting monument.

Will you not now, while it is on your mind reach in your billfold and folding your bill or check in this letterhead, mail it directly on to the Kresses. While this grand old couple are still alive, and in fairly good health we felt that you would like to gladden their dear hearts with a contribution now, by sending it directly to them. Can't you just see their faces light up as these gifts come in, realizing that their influence will make possible another service to humanity by erecting a beautiful House of Worship to God.

To those who are able and willing, here is a suggestion: To all who contribute \$5,000 or more toward this memorial, their names will be engraven in stone within the nave, if agreeable. We hasten to say however, that any gift, large or small, will be gratefully acknowledged.

Please send all contributions to Dr. Daniel H. and Dr. Laretta Kress, 405 Niblic Ave., Orlando, Florida. Make out all checks to the Seventh-day Adventist Church building fund, because of income tax deductions.

Lives of Noble Service Crown the 65 Fullness of Years

By H. M. TIPPETT

Sixty-five years ago this past July, Dr. Daniel H. Kress and Dr. Laretta Kress, frequent contributors to the columns of LIFE AND HEALTH, were united in marriage, their common interest in service to humanity merging into a joint medical career that has brought them the deserved fame and honor which a grateful public bestows upon its benefactors.

Length of life is of little consequence unless the fullness of years also yields fullness of blessing within the sphere of one's influence. Measured by that standard, the contribution of the Doctors Kress to the relief of suffering and to the promotion of every factor of healthful living has made them more than octogenarians, for they have been ambassadors of the good life on three continents.

Graduates of the University of Michigan Medical School in 1894, they began their practice in Battle Creek, Dr. Daniel Kress as a specialist in gastrointestinal disorders, and Dr. Laretta Kress in obstetrics and gynecology. More than four thousand babies have been ushered into life under the latter's ministries, and thousands of liquor and narcotic addicts owe their reclamation to useful citizenship through Dr. Daniel Kress's zealous promotion of

—Reprint of "Life and Health" article September 1949.

Note—Since this article was printed a year ago, the Kresses were honored at the World Conference of Seventh-day Adventists in San Francisco on their 66th Wedding Anniversary.



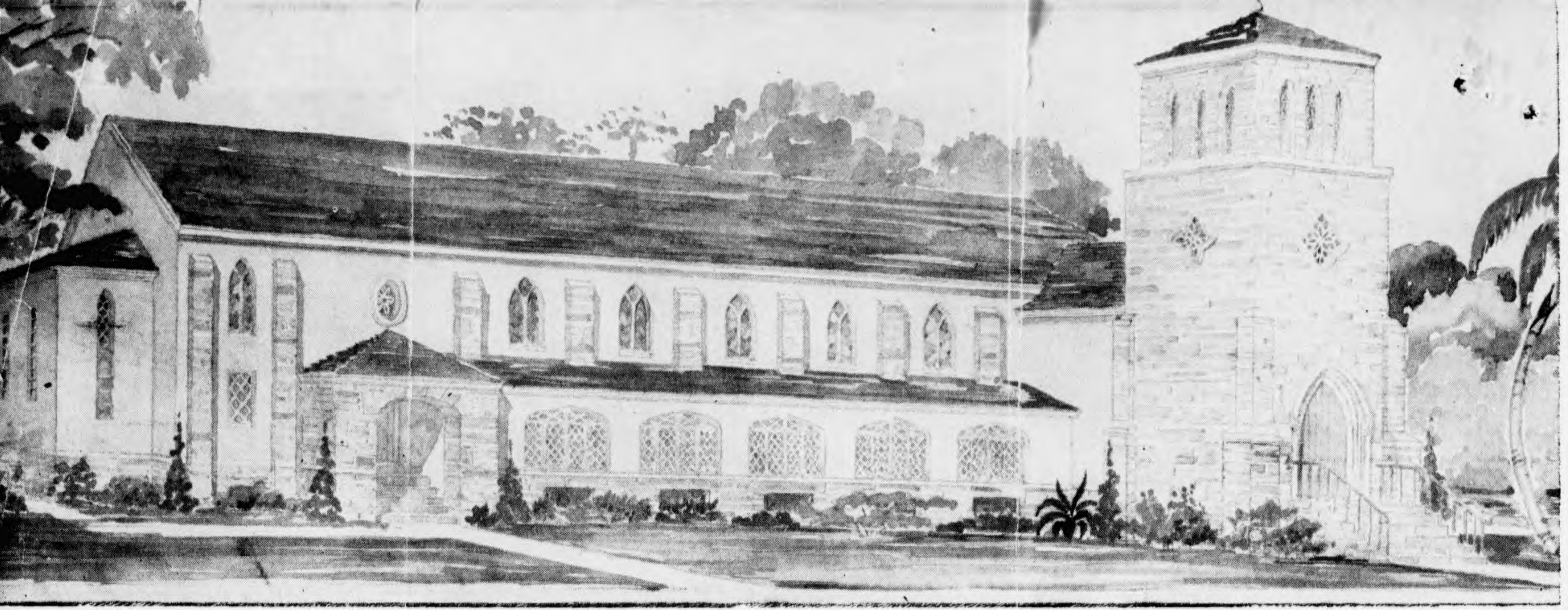
Dr. Daniel H. and Dr. Laretta Kress "Grandfather and Grandmother" of modern American medicine. We propose to do them honor.

temperance as the basis of good health and happiness.

From their earliest experiences as medical student volunteers in the Chicago Medical Mission, an adjunct to the famous Pacific Garden Mission during the World's Fair of 1893, where the degradation of men and women victimized by drink and narcotics made great appeal to their humanitarianism, the Doctors Kress have emphasized the importance of the spiritual factors contributory to the science of healing.

Pioneers in establishing health sanitariums in England, Australia, and America, they left them flourishing as promoters of the principles of vegetarianism and temperate living, of which they themselves have been ardent advocates, and to which they attribute their long usefulness and the enjoyment of a happy retirement.

Parental in their charities, Dr. and Mrs. Kress have nurtured at various times in their home a dozen orphaned or underprivileged children. These with thousands of former patients and friends, along with scores of men and women prominent in public life, will join in subscribing to this anniversary tribute.



To Be—The Kress Memorial Church



◀ The Interior

On either side of the nave, looking between graceful stone colonnades, one will view the handiwork of God. For there in tropical setting will be rock gardens and vines; pools, where silver and golden fish will glide silently and reverently beneath some leaf or lily; palms will nod a silent welcome to all who worship there; leafy ferns and tropical plants without words will invite the worshippers to lift their hearts in reverent prayer to God; soft-warbling canaries will eagerly invite all to sing praise with them; while bright flowers will silently, yet gladly, join in.

Why We Ask You To Have A Part

In tribute to Daniel H. Kress, physician, author, lecturer and promoter of medical research, and to his good wife, Dr. Lauretta Kress, physician, who has served nobly in many medical capacities we propose in Winter Park, Florida, to dedicate our new Church to them. We plan to erect this monument, the Lord willing, in the near future, calling it "The Kress Memorial Church," after they are gone. While they are still with us, it will be known as "The Kress Seventh-day Adventist Church." The Kresses have consented, and seem happy about it, but have been very humble.

We feel that their hosts of friends, and others will want to do them honor, and have a part in erecting a living memorial and so we extend an invitation to all who hear about this project to have a part, while the Kresses are still with us.

The Kresses have been liberal in contributing personally to the building fund of this church. The Doctors Kress were charter members of this church when it was organized nine years ago and are still worshipping with us. All our own members have been generous with gifts of cash, pledges, which are continually coming in, and pledged labor. The cash available and that which purchased our lot and other expen-

A place that will be "NEAR TO THE HEART OF GOD." When you tour Florida, you are invited to visit the beautiful church in Winter Park which your dollars have helped build, in honor of two noble Christian Physicians. It's doors will always be open to our many visitors, who will stop and reverently view, "GOD'S HOUSE" in Winter Park, "THE CITY OF HOMES"



Longevity file

WORLD IS NOT PREPARED FOR 1000-YEAR-OLD MAN

Scientists, However, Admit the Possibility of a Race of Methuselahs, as Pictured by Prof. Haber— Factors That Destroy Life

my Jones
Sept. 19/24

By WILLIAM L. CHENERY.

DROFESSOR Fritz Haber, the "enigmatic German scientist," who struck an optimistic note at the recent centenary celebration of the Franklin Institute of Philadelphia when he discussed the possibility of lengthening human life to a span of a thousand years, finds support for his ideas among American scientists.

It is, of course, not at all certain, despite the cheerfully efficient George Bernard Shaw, that any son of woman will ever desire to live a thousand years. After seven or eight decades of struggle the will to live becomes feeble and most men and women are ready for another "great adventure." Even Shaw, the protagonist of the new Methuselah, was able only to picture a world of aged men and women which would have been infinitely tedious to those nurtured on the present zest of life. Still if some future race could bring itself to endure the tedium of centuries of existence, science sees no insurmountable barriers to such a prolongation of life.

Such, at any rate, is the deliberate conclusion of Dr. Eugene Lyman Fisk, medical director of the Life Extension Institute. Dr. Fisk has admittedly a professional interest in longevity. But he is a retailer in comparison with the wholesale estimates of Professor Haber. The medical man thinks chiefly of the immediately practicable program of adding ten or twenty years to the average duration of life; at the same time he concedes the reasonableness of such an indefinite extension of living as was pictured by the German biologist.

The point on which Dr. Fisk insists is that most people think that time causes death, whereas actually time causes nothing. After a certain number of years the life span may be over, but time is not to blame. Old age never killed. Evils unchecked destroy life in infancy and at all other periods of development, but the passage of years has not been the destructive influence. It is a great fallacy to regard time as the destroyer. Actually time is but a spectator at the drama, a neutral onlooker witnessing the ceaseless conflict of existence.

Experiments in Prolonging Life.

"There are numerous experiments on record where the so-called influence of time has been defied and a definite prolongation of the life span attained," said Dr. Fisk. "To me, the testimony from the field of biology where profound changes have been effected in the life cycles of other organisms offers a conclusive answer. The human organism cannot be separated from the rest of living organisms. If it can be shown that life cycles are not preordained or immutably fixed, we may face the problem of extending the human life cycle, of expanding the power of the human organism exactly as we would face such problems in the laboratory when dealing with the fruit fly or the sea urchin or the starfish or the tadpole.

"There are living organisms such as the redwood tree that have a life cycle apparently limited only by the geologic age in which they live. There are others that live but a day because of obviously faulty structure. Working with the fruit fly, Loeb and others have prolonged this life cycle 900 per cent, merely by keeping it at a lower temperature and protecting it from adverse external factors such as infection and poison.

Eliminating the Poisons.

"Some eight years ago Dr. Alexis Carrel apparently solved the problem of the maintenance of life in a group of tissue cells for an indefinite period without reproduction. The profound philosophical significance of this remarkable experiment seems not to have been generally recognized. Carrel secured some connective tissue cells under aseptic conditions from the heart of a chicken embryo. These cells were placed in an aseptic nutrient medium—chicken plasma. He protected them from infection or adverse external factors of any kind and he periodically washed them of poisons arising from the metabolic processes in the cells. Not only has this strain been kept alive, but it has grown. Carrel himself, in commenting in his first report on this experiment, stated that these cells had apparently been removed 'from any influence of time.' Of course this was a mere figure of speech and carries with it the misleading implication that time has something to do with the aging process in living organisms. What Carrel has positively demonstrated is this: That these changes are not due to time but to the very factors he has successfully combated—infection, poison, injury, starvation.

"Loeb and Northrup, although working along different lines, demonstrated the factors responsible for so-called 'natural death.' Loeb advanced the theory that 'natural death' is due to the cumulative effect of poisons formed in the organism or the loss of substances, such as hormones, which are required to stabilize the tissues in a state of health. What actually occurred in the case of the fruit fly was pathological, not physiological, death. In other words, some inherited fault in the organism which rendered it unable either to manufacture the necessary hormones or to excrete the poisons formed in the tissues actually brought about death.

"The life of the fruit fly, by means of a reduction in the temperature from 30 to 10 degrees Centigrade, was prolonged 900 times. Loeb figured that if by any means it should be possible to lower the temperature of the human body to 7.5 degrees Centigrade human life could be extended to 1,000 years. This was, of course, not a prediction but simply a logical principle derived from these experiments. He quite clearly stated that the human organism cannot take on the temperature of the surrounding air, as does the fruit fly, and even if it could live at that low temperature would be wholly undesirable.

Factors That Affect Span of Life.

"Nevertheless, the principle of the non-fixity of the life cycle has been demonstrated by such experiments and there are many conceivable modifications of environment other than temperature reduction that could affect the human life cycle. Indeed, very important modifications have already been made through the intelligence of man; and there has been a profound influence already exerted upon the average

duration of human life, although it cannot be said that the span of life has been greatly extended, since most of the benefits conferred by sanitary science have been experienced in infancy or early adult life.

"When we proceed to scrutinize the actual condition of living human bodies we have still further confirmation of these theories, and we are led to a knowledge of the ways and means by which many of these causes of physical deterioration can be met and neutralized. It is even possible to group under certain categories every conceivable influence that could operate to shorten human life or lessen its power. These are as follows:

"Heredity, always influential and sometimes definitely and hopelessly limiting the life span.

"Infection, acute or chronic, by bacteria or parasites, is probably the most potent cause of disease, old age and death.

"Poison from within or without; drugs, occupational poisoning, endocrine or other organic disturbances releasing poisons or interfering with their elimination.

"Food deficiency; general, as in a lack of sufficient food or specific as in a lack of some particular substance.

"Food excess.

"Air deficiencies or defects.

"Hormone deficiency is probably the greatest immediate factor in limiting the life cycle.

"Hormone excess.

"Physical trauma or injury.

"Psychic trauma. Fear, grief and emotional excess are more destructive than mental effort or work.

"Physical apathy; the lack of muscular effort and faulty muscular development have degenerative effects.

"Psychic apathy; the lack of interest in life induces physical apathy, with its attendant evils."

The problem of lengthening the span of life involves the conquest of these factors, said Dr. Fisk.

"Changes in the human body, considered marks of senility, may begin at a very early age," he added. "In these

affairs we have seen boys whose arteries or whose arteries showed the deterioration ordinarily associated with old age. Most impressive are the military figures from Great Britain. These showed a rejection rate of 22 per cent at the age of 18; 48 per cent, at the age of 23 and 69 per cent, at 41. The draft figures of this country recorded the rejection of 34 per cent, of those between the ages of 21 and 31."

Goal to Which Science Looks.

The passionate abstractions with whom Shaw peopled his fanciful world of 4000 A. D. were hardly more than disembodied spirits. They were fit enough to survive in a Fabian heaven or hell, but they would be hardly tolerable on the earth. The prolongation of life toward which science looks does not have as its goal a society of aged philosophers developed beyond all human desire, but rather to an extension of youth. The problem is to find a fountain in which early maturity may be maintained, rather than a device for perpetuating old age.

Dr. Fisk points out "that even in a fairly long lifetime the period of exuberant vitality, when a man is in command of full physical reserves, is very brief." He continued: "It is this situation with which I quarrel and which offers a real appeal for scientific and sociological effort, rather than the mere prolongation of the life cycle. Unless we can extend and improve the period of high vitality, unless we can lift the physical handicaps that are now imposed upon us as age advances, there would be some logic in the proposal that has been made—that life be shortened as to its later stages.

"What we must vigorously combat is

the all too common medical attitude toward this problem—the disposition to regard the defects and impairments at each advancing decade as 'normal to the time of life.' They are never normal, any more than the former death rate in the Canal Zone was normal; and to set up such standards is to bar the way to scientific advancement.

"No one who has critically examined the evidence can deny the possibility or even the probability that science will be able within the near future profoundly to influence human development. No one who has studied the remarkable changes that occur in the human body

when certain specific substances—such as vitamins in our food or the hormones manufactured by the ductless glands and other organs—either withheld or administered in excess, can doubt that along these lines alone, entirely apart from other factors, it will be possible to influence both the life cycle and the physical type of human organism.

"Regardless of such special developments, however, we may confidently expect a very definite improvement in the physical conditions and in the longevity of individuals through meeting such influences as mouth infection or focal infections generally, syphilis and a long range of troubles that come from neglect of personal hygiene and failure properly to regulate exercise, activities and diet.

What Science Might Do.

"The first question that confronts us is the probable trend of scientific discovery and effort in the matter of the prolongation of human life. If the effort is applied chiefly along the lines of the correction of personal hygiene, eradication of infection and protection against poisoning, the progress in the lengthening of life will be very deliberate because it will be confined to people who have the ideals of conduct involved in carrying out such plans. There would result in the course of generations higher ideals of living, better adjustment to environment and no great social or political dislocation or disturbance.

"We are, however, at liberty to discuss the possibility of the development of specific means of maintaining health and vitality apart from those involved in a mere regulation of conduct. It is within the bounds of possibility that a

combination of specific substances adapted to the needs of certain types of individuals may ultimately be discovered which will make the prolongation of life a simpler matter than regulation of conduct alone.

"We should then be confronted with the choice either of race suicide carried to the 'nth power or what might be termed 'selective euthanasia.' Unless we practically abolished the birth rate we should be under the necessity of scientific regulation of the death rate, and it would then be 'up to' a jury to decide as to those who were to live and those who were subjects for euthanasia. There would, of course, be wide scope here for human feeling and prejudices."

The human race in its present types is said by some scientists to be not more than 100,000 years old. The earth, it is reckoned, may continue to be a fit habitation for men throughout a period of perhaps 3,000,000 years. Plainly there is time enough for the improvement of men through scientific methods, or even for the supplanting of the present heirs of the universe by other beings able to adapt themselves to the difficulties of living.

Although occasionally scientists look out the window at the long possibilities which the imagination may envisage, they much prefer to concentrate attention on what their laboratories have already made certain. Dr. Fisk is definitely of that persuasion. The extension of life now attainable concerns him far more than the potential advance of the future.

Progress in the Last Century.

He remarks that within the past century twenty years have been added to the expectation of life at birth. Insur-

ance tables covering the New England States showed in 1788 an expectation at birth of 35.7 years. The present expectation is something above 55 years. The gain has been made chiefly through the protection of infancy. A man 50 or 60 years old has today hardly more of an assured expectation of life than his great-great-grandfather. In 1789 the expectation of life for the average man of 50 was 21.36 years; in 1920 it was 21.54 years. The gain is not notable.

Furthermore, as Dr. Fisk points out, after the age of 30 each decade brings its physical handicaps and restrictions. The prizefighter of 30 is regarded as an "old man." At 40 the general death rate is nearly three times what it was at 20. Yet specifically selected groups show very favorable figures. Thus a study of the mortality of the graduates of Smith, Wellesly and Vassar Colleges over 40 years old gave a rate less than one-third of that of the entire population.

Medical and biological research are pioneering the way to larger discoveries. Tuberculosis has been partly conquered, typhoid fever, yellow fever and many of the infectious diseases have made part surrenders to the attack of scientists who have followed in the wake of the great biologist Louis Pasteur. Fresh achievements such as the discovery of insulin by Dr. Banting are being made, and slowly, very slowly, the approach is being made toward the goal sought by Ponce de Leon and others who would retain life at the period of exuberant vitality. Perhaps some day science may in fact bring within the realm of possibility a new age of Methuselahs. When that is in sight it will be time enough to decide whether an indefinite prolongation of life is desirable. For the present men will be content with smaller gains.