

The Biblical Chronologist

WHAT HAS BEEN IS REMOTE AND EXCEEDINGLY MYSTERIOUS. WHO CAN DISCOVER IT?
(Ecclesiastes 7:24)

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The Cause of Reduced Post-Flood Life Spans – Part IV

Introduction

The study of degenerative pathological changes of old age... may well belong to a future chapter of vitamin research.

—Casimir Funk, 1949.¹

Review

In the three preceding articles in this series I have attempted to demonstrate that nobody dies of “old age” today—that what we call “old age” is simply a disease, like any other disease, and that death due to this disease has nothing really to do either with “old” or with “age”. I have pointed out, for example, that since Genesis plainly shows us that people once routinely lived in excess of 900 years, even an age of 125 years is clearly not old for humans.² Far from supporting the notion that people die of “old age” today, Genesis makes it clear that even the most advanced in years among us are dying at tragically *young* ages.

I have further pointed out that there seems no good reason to believe in an intrinsic time limit on life—that each species has a fixed life span assigned by the Creator.³ Biological organisms are not designed to “grow old” and die at all. They are designed to go on living forever. Time does not kill biological organisms; it is entirely benign. Death results only from mishap and disease.

¹Walter H. Eddy, *Vitaminology: The Chemistry and Function of the Vitamins* (Baltimore: The Williams & Wilkins Company, 1949), Foreword.

²Gerald E. Aardsma, “The Cause of Reduced Post-Flood Life Spans – Part I” *The Biblical Chronologist* 7.2 (March/April 2001): 1–6.

³Gerald E. Aardsma, “The Cause of Reduced Post-Flood Life Spans – Part III” *The Biblical Chronologist* 7.5 (September/October 2001): 1–5.

“Old age” is no exception to this rule. We must not allow the complex of symptoms we call “old age” to fool us. “Old age” holds no special status in the field of medicine—it is simply a disease, like any other disease.

In a deliberate effort to leave the universal misconception—the myth—of “old age” behind us, I have previously suggested we (temporarily) call this disease “Malady \bar{X} ” (read “Malady X-bar”).⁴

The Pressing Question

Once it is recognized that “old age” is a misnomer for what in reality is an ordinary disease, the pressing question becomes whether something might be done to cure this disease.

I call this question “pressing” for several reasons. It is “pressing” first of all because many millions of individuals are dying of this disease every year—over 100,000 people die of Malady \bar{X} each day. It is “pressing” because hundreds of years of potential life span is clearly a very great loss for any individual. And it is “pressing” because Malady \bar{X} affects each and every one of us—not only those we hold near and dear, but indeed even our very selves—robbing us year by year of strength and health and, ultimately, before the vast majority of us have seen even a dozen decades, of life itself. Neither science nor medicine can field any question today of greater practical importance or urgency than this one.

Is it possible to put a stop to this devastating disease—to discover its cause, and to elicit its cure?

⁴Gerald E. Aardsma, “The Cause of Reduced Post-Flood Life Spans – Part I” *The Biblical Chronologist* 7.2 (March/April 2001): 1–6.

A Moral Imperative

As I have attempted to show previously, it appears that Biblical chronology alone offers a platform from which an intelligent assault on this research problem can be launched. All indications are that the insight into human longevity which Genesis uniquely offers, coupled with the insight into Genesis which correct Biblical chronology uniquely offers, is worth more than any number of medical research degrees or any wealth of medical research funding in regard to this problem. It presently appears that the solution to this problem will be secured from the distinctive platform which Biblical chronology offers, or it will not be secured by any human means at all.

It is curious that such an obviously *medical* matter should emerge from the discipline of Biblical chronology. But indeed it has, bringing with it an unavoidable moral imperative to take up its cause and *do* something about it.

For me this has meant increasingly focusing all effort and all resources on this single issue over the past several years. For the past year it has meant going at it hammer and tongs, while neglecting all else, typically twelve to fourteen hours per day, six days per week. I think it likely that none will be more happy than I when the research is complete and the matter is finally resolved! Regardless, I am pushing this work forward as rapidly as personal health and strength permit.

It has meant significant sacrifice and investment of resources by a number of other individuals as well. These do not need or wish me to sing their praises here, but I am truly thankful for them, each one. Without them the work described in this series of articles would not have been possible.

Malady \bar{X} is real, its toll on human life and health is immense, and, in consequence, the moral imperative to do whatever we are able in regard to it is clear.

Purpose

In this fourth article of this series I want at least to take us one step closer to the goal of elucidating the cure of Malady \bar{X} . We must, of course, understand the nature of the disease before we can hope to prescribe a cure for it. My purpose in this article is to show which category of diseases Malady \bar{X} belongs to. My thesis is that we must assign it to

the **deficiency disease** category.

Deficiency Diseases

The human body is made up of billions of microscopic cells. Each cell can be thought of as a very complex and busy city, part of a vast empire (the body). Each moment raw materials flow into these busy cities, and, together with some waste, many finished products necessary to the overall growth, function, and maintenance of the empire flow out.

Among the raw materials flowing into these cities each moment are some which can only be obtained from outside the boundaries of the empire. (An obvious example is oxygen. Our bodies cannot manufacture oxygen. We must get it from the atmosphere, by breathing.) Many of these raw materials are absolutely vital to the cities—the cities cannot produce necessary finished products without them. If the supply of any one of these vital raw materials is halted for any reason (for example, lack of oxygen due to strangulation), production of one or more vital finished products ceases. The health of the empire then suffers and, if the lack of this vital raw material persists long enough, the empire eventually disintegrates (i.e., the body dies).

On the list of vital raw materials needed by our bodies are such things as oxygen, water, carbohydrates, fats, protein, certain minerals (calcium, phosphorus, sodium, potassium, chloride, magnesium, iron, copper, iodine, and many others in minute amounts), and a curious assortment of just over a dozen organic substances we call vitamins. If for any reason the cells of the body are unable to obtain one of these vital substances, a deficiency disease results.

The most common cause of deficiency disease is inadequate diet—the essential raw material is simply not being taken into the body. But there are other possible causes, such as a faulty digestive system resulting in inadequate absorption of an essential raw material once it has been ingested, or combination of the essential raw material with some other chemical and subsequent elimination, for example.

Of the list of essential raw materials needed by the body, the vitamins are of particular interest in the present context. I suggest that Malady \bar{X} is, in fact, a vitamin deficiency disease.

Vitamin C

Scurvy is an example of a vitamin deficiency disease. It results from a diet deficient in vitamin C.

Before it was understood that scurvy is a deficiency disease, scurvy was a common disease of mariners. Vitamin C is abundant in fresh fruits and vegetables, so most of us get plenty of it in our normal diets each day. Vitamin C is easily subject to oxidation, however, so vitamin C levels decline in fruits and vegetables once they have been picked. Following prolonged storage, vitamin C levels in fruits and vegetables become inadequate to meet human dietary requirements for this substance. The difficulty of providing mariners with fresh produce on long sea voyages inevitably resulted in many cases of scurvy.

Long before vitamin C was discovered, a number of individuals began to understand that scurvy could be prevented by a diet containing adequate fresh fruits and vegetables. Ways were sought and eventually found to concentrate and preserve lemon juice which protected its anti-scurvy property. Early in the 1800's the British navy adopted regulations requiring daily consumption of lemon juice—bringing the scurvy plague to an end in the British navy. Eventually this simple remedy was adopted by commercial vessels as well. The substitution of cheaper lime juice for the original lemon juice led eventually to the slang designation of British sailors as “limeys”.

The actual anti-scurvy factor in fresh fruits and vegetables—vitamin C—was only isolated, and its molecular structure determined (Figure 1), about seventy years ago.

Vitamin C is a relatively simple organic molecule, but the human body is unable to synthesize it. This simple molecule is vital to human health. Without it connective tissues between cells degenerate. This results in a complex of symptoms at the whole-organism level. Most conspicuously, blood vessels become weak and hemorrhage results, and teeth lose their strength and become diseased.

Adult patients suffering from scurvy complain of weakness, pains in their legs, swollen and bloody gums and hemorrhages. Examination discloses petechiae, chiefly about the hair follicles of the lower

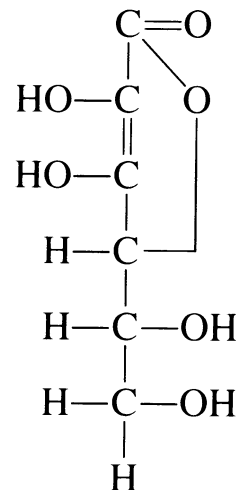


Figure 1: The structure of the vitamin C molecule.

extremities and sometimes brawny, tender thighs. All of these features are due to hemorrhage...

Weakness is usually the first thing complained of by persons suffering from vitamin C depletion. Fatigue, palpitation and breathlessness are also common. The patients dislike to stand or walk and often affect a rather characteristic standing position with their legs slightly flexed. The complexion is pallid and dirty looking. Gingivitis occurs, followed by loosening of the teeth, a consequence of resorption of the alveolar bones and infections about the teeth and is accompanied by a foul breath. Other signs of scurvy are hematuria, bloody diarrhea, nasal hemorrhage or hematomas about the jaw or bones of the lower extremities.⁵

Vitamin C is only needed in minute amounts—about one ten-thousandth of our daily food intake on a dry weight-per-weight basis. This miniscule daily requirement relative to the bulk diet is characteristic of all the vitamins. In the case of vitamin D the amount needed is roughly one five-millionth of our daily food intake. But though so little is needed, this small amount is absolutely essential.

⁵Walter H. Eddy and Gilbert Dalldorf, *The Vitaminoes: The Chemical, Clinical and Pathological Aspects of Vitamin Deficiency Diseases* (Baltimore: The Williams & Wilkins Company, 1937), 175.

Without it our cells lose their ability to carry out their jobs, and, eventually, a complex of whole-body symptoms—a deficiency disease—develops.

Central Hypothesis

My central hypothesis is that Malady \bar{X} is a vitamin deficiency disease resulting from the lack of some unknown vitamin—vitamin X. (The “bar” in Malady \bar{X} (Malady X-bar) signifies negation. “Malady \bar{X} ” means “the disease due to not X” or “the disease due to lack of X”. In this nomenclature scurvy is “Malady \bar{C} ”, beriberi is “Malady \bar{B}_1 ”, and rickets is “Malady \bar{D} ”.) Support for this hypothesis is perhaps most easily gleaned by comparing and contrasting Malady \bar{X} with scurvy.

Complex of Symptoms

Notice, first of all, that like scurvy, “old age” exhibits itself as a complex of whole-body symptoms: skin loses its elasticity, muscles weaken and decrease in size, hair loses its color and thins out, bones become brittle, eye lenses stiffen. . .

These are very diverse symptoms. Yet they show up together in “old age”. One could suppose that they are all caused by independent physiological malfunctions of one sort or another, and that these independent malfunctions are all synchronized by some sort of master biological time-clock. But much simpler is the idea that these diverse symptoms are simply varied macroscopic manifestations of a single underlying malfunction operating at the microscopic, cellular level—just as is the case with scurvy.

Particular Symptoms

Not only is there a complex of whole-body symptoms in both cases, but some of the particular symptoms of “old age” show striking similarities to symptoms of scurvy.

Aschoff and Koch were greatly impressed with the similarity of the scorbutic [scurvy] lesions to those in senility. The changes in cortical bone are difficult, if not impossible to distinguish. . . . In both conditions the bones are notably thin and rarefied, susceptible to fracture and defective in the ability to form a callus once fracture has occurred. . . .

Westin interpreted the tooth lesions as similar to the atrophy of old age and said scurvy may be considered to hasten involution. In his cases the teeth showed the same resistance to caries that is seen in senility as well as the rarefaction common to advanced years.⁶

This demonstrates unequivocally that deficiency disease can produce precisely the same sorts of abnormal changes and injury to body tissues as those which are characteristic of “old age”. Evidently then, at least some of the specific symptoms accompanying “old age” fall naturally within the deficiency disease category.

Apparent Contrast

An apparent contrast between “old age” and scurvy is that only a small percentage of individuals in a normal population ever contracts scurvy, while all individuals, if they live long enough, contract Malady \bar{X} .

This apparent difference is easily explained. The reason for it, of course, is that normal diets of most individuals supply them amply with vitamin C—only the few individuals on deficient diets ever contract scurvy. In contrast, normal diets of *all* individuals since the Flood have been seriously deficient in vitamin X. (I hope to show the reason for this in a future article in this series.)

Variable Time of Onset

Another similarity between “old age” and scurvy is that the time of onset can be varied. Prior to the Flood men lived in excess of 900 years before they succumbed to “old age” and died. After the Flood men contracted “old age” at younger and younger ages, until the present, much-diminished life span near 75 years was reached (Figure 2).

The time of onset of scurvy can be similarly varied:⁷

⁶Walter H. Eddy and Gilbert Dalldorf, *The Vitaminoes: The Chemical, Clinical and Pathological Aspects of Vitamin Deficiency Diseases* (Baltimore: The Williams & Wilkins Company, 1937), 194.

⁷Walter H. Eddy and Gilbert Dalldorf, *The Vitaminoes: The Chemical, Clinical and Pathological Aspects of Vitamin Deficiency Diseases* (Baltimore: The Williams & Wilkins Company, 1937), 163.

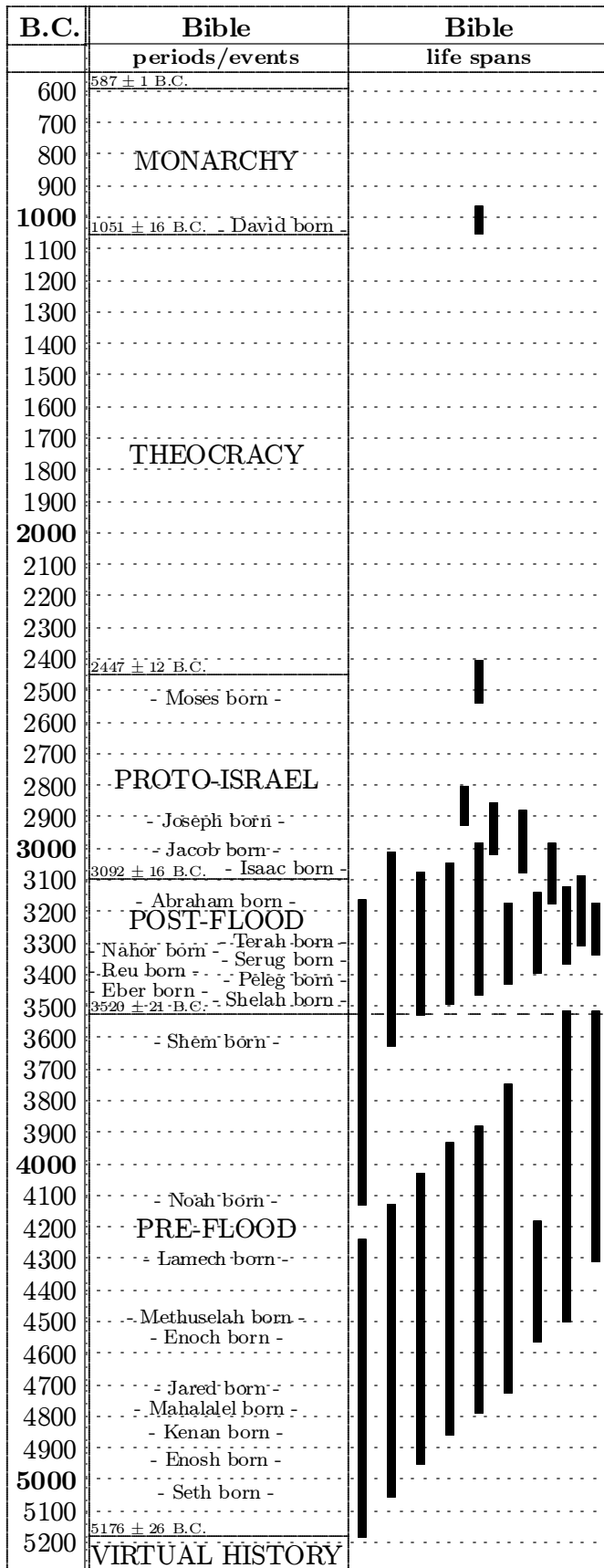


Figure 2: Biblical life span data. The birth date of individuals whose life spans are plotted as solid vertical bars in column 2 are shown in column 1.

They found that less than 50 cc. of milk daily resulted in scurvy within thirty days, that 50 cc. delayed the onset of the disease until the seventy-fifth day and that 100–150 cc. of milk postponed evidence of scurvy for four months.

Why Life Spans Changed

Milk is a poor source of vitamin C. Thus all of the animals (guinea pigs) referred to in the previous quote were subject to a vitamin C deficient diet. Those getting less milk got less vitamin C. Thus the time of onset of scurvy is seen to be directly related to the daily dose level of vitamin C in the diet.

I suggest that this dose-dependent time-of-onset characteristic of vitamin deficiency diseases is the fundamental explanation of the change in human life spans which Genesis records following the Flood. I suggest that life spans diminished following the Flood because vitamin X became increasingly scarce after the Flood. (Note that the fact that none of the pre-Flood patriarchs lived more than 1000 years before dying of “old age” implies that vitamin X was already somewhat deficient in diets after the Fall and before the Flood.) By 2500 B.C. (one thousand years after the Flood) vitamin X had dwindled to the seriously deficient level which characterizes it today. (I plan to show why vitamin X behaved this way in a future article in this series.)

Age-specificity

A second contrast between scurvy and Malady X̄ is that scurvy can be contracted at any age, even infancy, while Malady X̄ (“old age”) only (and inevitably) begins to show up in the fourth decade of life. “Old age” is age-specific while scurvy is not.

This difference is also easily explained. It is due to differences in the dose rates of the two vitamins involved.

Imagine that a certain rigidly controlled, somewhat deficient, fixed daily dose of vitamin C results in the onset of scurvy after ten years. If this dose was administered to the entire population from the time of birth on, then we would no longer see any cases of scurvy in infants. Rather, we would find that the entire population tended to

develop scurvy around ten years of age, and expire of that disease sometime soon thereafter.

Our natural dose of vitamin X, I suggest, is of this sort. Nature uniformly meters out vitamin X to all individuals in a rigidly fixed dose from the time of birth on. For this reason the entire population tends to contract “old age” at approximately the same age, with death due to this disease generally following within a few decades.

Summing Up

I am aware of nothing about “old age” which is inexplicable in terms of deficiency disease. This category of disease seems to provide a complete explanation of the facts we possess in regard to “old age” and human longevity. To the best of my knowledge, this is true of no other category of known diseases.

Thoughts and Speculations

The analogy between scurvy and Malady \bar{X} leads to several interesting predictions. Until confirmed by experiment these predictions can only be regarded as possibilities—speculations. In actual fact, the only experimental data we currently have on the behavior of Malady \bar{X} at higher doses of vitamin X than that which pertains at present are those which the Bible affords, and these do not answer all of our questions, by any means. As a result we can only speculate on a number of important issues at present.

Curing “Old Age”

Notice, first of all, that we have seen that slight increases in vitamin C dose, in a diet which is deficient in vitamin C, result in lengthening delay before scurvy is manifest. Eventually, at large enough doses, the body’s need for vitamin C is entirely satisfied and scurvy is never manifest.

By analogy we are led to believe that at large enough doses of vitamin X “old age” will also never be manifest.

When this happens the survival curve for humans is expected to revert from its present Curve 2 form (see Figure 2 of *The Biblical Chronologist* Volume 7, Number 5) to its proper Curve 4 form. Normal life expectancy for humans will then be measured in centuries or millennia rather than in decades as it is at present.

The probability of death will no longer increase as one advances in years in that case. The leading causes of death are likely to be accidents of one kind or another (like being in the path of a tornado in central Illinois in the spring) rather than “old age” or other disease as at present. All of this is very good news for the eventual cost of life-insurance premiums, of course. It is not good news for gerontologists and undertakers.

Nature of the Cure

A very large question regards the prospects for those of us who are already caught in the grip of Malady \bar{X} —some more strongly than others. One can imagine two major possibilities for “the aged” upon restoration of diets to proper vitamin X levels. The first is that, though further “aging” is brought to a stand-still, what has already been lost to “aging” can never be regained. The second is that not only is further advance of Malady \bar{X} halted, but substantial healing also takes place, restoring one’s body to a more youthful health and vigor.

Of these two, the second is by far the most attractive. Happily, it receives substantial encouragement from the scurvy analogy. Eddy and Dalldorf state that “symptomatic recovery occurs very quickly under specific treatment”.⁸ These same researchers document the recovery of a “severe case” of scurvy in an adult in which “symptomatic recovery commenced on the fifth day and was complete on the tenth”.⁹

At the microscopic, cellular level, typical observations are as follows:

These unique and specific characteristics are almost immediately altered by the administration of vitamin C. The fibroblasts are promptly surrounded by a thin shell of osteoid material and resume their rounded form. Trabeculae rapidly form, irregularly at first and gradually becom-

⁸Walter H. Eddy and Gilbert Dalldorf, *The Vitaminoses: The Chemical, Clinical and Pathological Aspects of Vitamin Deficiency Diseases* (Baltimore: The Williams & Wilkins Company, 1937), 182.

⁹Walter H. Eddy and Gilbert Dalldorf, *The Vitaminoses: The Chemical, Clinical and Pathological Aspects of Vitamin Deficiency Diseases* (Baltimore: The Williams & Wilkins Company, 1937), 189.

ing more orthodox in appearance until nothing remains to indicate that scurvy has been present.¹⁰

Delayed Development

Another interesting question regards the interplay of development, or maturation, and Malady \bar{X} . Does childhood last longer when diets contain larger amounts of vitamin X?

The Biblical evidence we have concerning this question seems to answer in the affirmative. Notice that age 65 is the *earliest* any of the pre-Flood patriarchs is recorded to have fathered a son (Genesis 5). This list includes data from a total of ten males. Today we would anticipate an age closer to 20 years in such a case. Thus, it appears possible that maturation is being unnaturally accelerated today as a result of the physiological stress imposed by Malady \bar{X} .

Unfortunately, I have, so far, been unable to find any data on this question from scurvy or any of the other deficiency diseases.

Morphological Change

A related question is whether proper doses of vitamin X would affect human adult morphology. A leading example here is that of jaw development. Today many individuals end up having their wisdom teeth extracted because there is insufficient space in their jaw for their wisdom teeth to come through. It seems impossible that such a state of affairs could be a design feature. The idea that it represents some sort of evolutionary development seems similarly deficient. Is it possible that the true explanation is that physiological stress due to vitamin X deficiency prevents full jaw development in many instances at present? Would people raised on a diet containing adequate vitamin X tend to have larger jaws than adults today?

While I have no data on jaw development in cases of scurvy, there is this on tooth development in guinea pigs:

The normal rate of growth of the guinea pig incisors is 0.7 to 0.8 mm. per day.

¹⁰Walter H. Eddy and Gilbert Dalldorf, *The Vitaminoses: The Chemical, Clinical and Pathological Aspects of Vitamin Deficiency Diseases* (Baltimore: The Williams & Wilkins Company, 1937), 187.

In complete vitamin C deficiency, after a short period of lag, growth ceases. On partially deficient diets the rate of growth is roughly proportional to the amount of vitamin C in the diet.¹¹

Fertility

The question of the length of the fertile phase of life is obviously one of great interest in the current context. The Biblical data show unequivocally that males on vitamin X enriched diets remain fertile much longer than today. Noah, for example, fathered sons at 600 years of age.¹²

We have much less data on Biblical women, but it is difficult to see why there should be any difference in the length of fertility in the two sexes. A small hint that women too may have enjoyed prolonged fertility is provided by the case of Eve, who bore Seth to Adam after Cain, her eldest son, had murdered Abel.¹³ But this is admittedly far from definitive since such a sequence of births is possible for women even today.

Here again I have no analogous data from scurvy to help light the darkness. From a theoretical perspective, however, it is difficult to see why “perpetually youthful” and “perpetually fertile” should not coincide. It seems most likely here again that the physiological stress of Malady \bar{X} is the entire cause of menopause and the natural loss of fertility in both women and men of advanced years today. In regard to guinea pigs, once again, we find:

Scurvy produces atrophy and degeneration of the germinal epithelium as Medes has shown, and early destroys the ability to sire litters. In the female the oestrus rhythm is maintained in moderate deficiency but is suspended if the deficiency is severe enough to produce emaciation.¹⁴

¹¹Walter H. Eddy and Gilbert Dalldorf, *The Vitaminoses: The Chemical, Clinical and Pathological Aspects of Vitamin Deficiency Diseases* (Baltimore: The Williams & Wilkins Company, 1937), 188.

¹²Genesis 5:32.

¹³Genesis 4:25.

¹⁴Walter H. Eddy and Gilbert Dalldorf, *The Vitaminoses: The Chemical, Clinical and Pathological Aspects of Vitamin Deficiency Diseases* (Baltimore: The Williams & Wilkins Company, 1937), 190.

Population

The idea of perpetual fertility is sure to raise concern of population explosion in many minds today, especially when coupled with the prospect of a dramatically reduced death rate. However, given the modern availability and widespread use of birth control technologies, there seems little practical cause for alarm.

Of great interest in regard to rate of population growth is the evidence from archaeology that the world did not become overrun with people in the 1,650 years which separated the creation of Adam from Noah's Flood. This suggests that increased levels of vitamin X do not automatically imply an increased population growth rate. There are several possible reasons why this may be so. For example, if maturation is indeed delayed by vitamin X enriched diets, as discussed above, then the onset of fertility would also be delayed. As another example, it is possible that return of fertility following pregnancy may be significantly delayed on vitamin X enriched diets, so that the rate of conception is much reduced relative to today.

In any event, let us notice that the great problem faced by pre-Flood humanity, when superlongevity was normal, was not overpopulation. Rather, it was moral corruption and violence.¹⁵ Perhaps we can learn this one important lesson from history, that *people* are not the fundamental problem; *sin* is the fundamental problem.

Social Change

The prospect of superlongevity raises many issues of social change as well. The normal modern life sequence of training for two or three decades, service for three or four decades, and then retirement until death, will no longer be practical. (Is this the way out of the mess the Social Security Fund is in?)

But what will replace this normal sequence? Will people cycle through multiple careers through the centuries of their lives? Or will they grow disillusioned with the rat-race of modern life after their first one or two centuries, and find ways to live quietly, modestly, and in peace? Or. . . ?

And what will be the consequence for business and government when leadership begins to fall to

individuals who have lived and learned for 500 years rather than just 50 years?

Change always entails uncertainty, of course. And uncertainty can easily spawn fear. But if we step back and view the matter unemotionally, there seems little legitimate cause for fear.

I have previously used the analogy of a small island population, cut off from the rest of the world, all of whom died before they reached forty years of age as a result of a genetic disorder.

We can easily imagine that individuals in such a population might suffer apprehensions in regard to the prospect of their genetic disease being cured, and their living beyond the "natural" limit of forty years. But I think most of us would feel that such apprehensions were a little silly.

Immediate Future

Regardless, it is premature to take on such concerns at this stage.

Having come to the understanding that Malady \bar{X} is a vitamin deficiency disease, the obvious next step is to find out just what substance vitamin X is. I hope to share my thoughts and experience on this matter in future articles in this series. \diamond

The Biblical Chronologist is a bimonthly subscription newsletter about Biblical chronology. It is written and edited by Gerald E. Aardsma, a Ph.D. scientist (nuclear physics) with special background in radioisotopic dating methods such as radiocarbon. *The Biblical Chronologist* has a threefold purpose:

1. to encourage, enrich, and strengthen the faith of conservative Christians through instruction in Biblical chronology,
2. to foster informed, up-to-date, scholarly research in this vital field within the conservative Christian community, and
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¹⁵Genesis 6:11, for example.