Gerontological Research and The Secrets of Ageing:

("You're Just a Tyke. Why I Remember, Four or Five Centuries Ago . . .")

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As the record-holder for human longevity, Methuselah would probably have needed help with the birthday candles. Blowing out 969 candles takes some lung power, and Methuselah was getting on a bit.

But maybe Methuselah's great age, and the life spans of other antediluvian (pre-Flood) humans, were only mythical--or perhaps their ages do not refer to solar (356-day) years. That's the position taken by most scholars, who find plainly fantastic (i.e., unbelievable) the multi-centennial life spans ascribed to the pre-Flood Biblical patriarchs (Gen. 5) and the first post- Flood generations (Gen. 11:10-25). No one could possibly have lived that long, it is said, and only when Biblical life spans approach those expected for pre-modern civilizations, at approximately the time of Abraham, can they be taken seriously.

Long life spans are a serious puzzle for the young-earth creationist who wants to hold both science and the Bible record in high regard. How are we to square the Biblical pattern--very long life spans before, and immediately after, the Flood--with the fact that no modern humans with authenticated birth records have lived more than 120 years?

For the skeptic, the answer is easy. The Biblical life spans are mythical, and on the same level as the fabulous accounts of extremely long life spans in other ancient cultures. By contrast, the Bible believer recognizes these Biblical life spans as accurate historical information, yet explains them through non-miraculous means. Indeed, many of the church fathers, as well as the Puritan thinkers of later centuries, accepted the factuality of the multi-centennial life spans (for a historical survey, see Patten 1982). Of course, the

long time spans given in the Bible do not cover the entire human race, but concentrate on one line of descent (Wieland 1994, 140).

Some creationists have suggested that there was a canopy around the earth before the Flood, and have speculated that this canopy shielded the pre-Flood human population from harmful radiation, thus allowing very long life spans. Patten (1982) has a different explanation: increased quantities of carbon dioxide leading to greater vasodilation of blood vessels, allowing a richer oxygen supply to the brain. Both explanations assume that the causes of prolonged longevity were environmental.

By contrast, Wieland (1994) pointed out that aging is largely under genetic control, and his claim is borne out by recent research (reviewed by Partridge and Prowse 1994). Entire societies (e. g. the Hunzas) have individuals who live past 100 at far greater frequencies than could occur by chance, which is all the more noteworthy when their unhealthful living habits (e.g., smoking) are considered (Wieland 1994, 139-140). Overall, the present relatively short human life spans could be the result of deleterious mutations. Alternatively, post-Flood populations could have experienced a progressive loss of beneficial alleles (good genetic variants), causing a progressive decline of life spans from centuries down to decades.

Modern claims of life spans in excess of 120 years have been discounted (Olshansky et. al. 1990, 635): these claims tend to occur in societies where the elderly are shown deference (out of respect), and hence long life spans are exaggerated. And, until fairly recently, gerontologists have argued that the human life span has a biologically predetermined upper limit (Curtsinger et. al. 1992, 461). Experiments had demonstrated that the cells in living organisms can only divide a limited number of times, and from this it was concluded that the human body can repair itself only so often before the whole system eventually failed (Barinaga 1991, 936). Medicine may be able to increase the fraction of the population that lives to 80 (or 100 or 120) years, but is powerless to help anyone live beyond the biologically-determined limit of 120 or so years.

How can we evaluate these claims? It is not as easy to study ageing as one might think. We lack sufficiently detailed mortality data for nearly all forms of life (Carey et. al. 1992, p. 457). Even human actuarial tables leave much to be desired. Finally, we cannot know the shape of the human survival curve beyond age 119 (Olshansky et. al. 1990, p. 638).

In spite of these limitations, the claim that there is a biologically-determined maximal life span can be tested experimentally. If the claim is correct, then there should be a massive die-off of organisms as they approach the chronological age of the biological limit (Curtsinger et. al. 1992, p. 461). But the evidence indicates the contrary.

Experiments with large numbers of medflies (Carey et. al. 1992) and fruit flies (Curtsinger et. al. 1992) indicate that, contrary to predictions on the biology of aging, there is no massive die-off of very old flies at or near a given age. Rather, the remaining life expectancy of very old flies actually increases at greater ages! Furthermore, there is evidence against the common notion that the elderly are frail because of the inevitable

"wearing out" of biological systems. Experiments on fruit flies (Service et. al. 1985) have shown that cohorts of older flies are more resistant to desiccation, starvation, and toxic vapors than are comparable populations of flies that do not live as long.

There is also evidence that increased life span is positively correlated with deferred sexual maturation. Put more simply, the later an organism begins its reproductive years, the longer it lives. This is clear in the case of the Biblical patriarchs (Beasley 1994, p. 191; Patten 1982). It is therefore most fascinating to note that numerous experiments (cited by Service et. al. 1995, p. 380) have shown that selection of various insect populations for high fecundity (reproductive rates) at later ages results in increased longevity!

But doesn't the obvious frailty of many old people prove that their bodies are wearing out? Not necessarily. We now know that many diseases once thought to be the inevitable consequence of aging (e. g. osteoporosis and atherosclerosis) can now be prevented or delayed (Barinaga 1991, pp. 936-7). Indeed, 80% of the deaths among people over 60 are caused by cancer, diabetes, heart disease, stroke, and chronic obstructive lung disease (Myers and Manton 1984, p. 350). It is specific diseases that kill old people, not some innate (or genetically determined) degeneration of living systems. If these specific diseases could be conquered, the return of multicentennial life-spans is at least a possibility (Barinaga 1991, p. 938):

. . . it doesn't mean that life expectancy will soar into the hundreds, as long as there are multiple, theoretically but not practically preventable diseases that are likely to kill people sooner..

It is obvious that, even considering the modern human life span, there is much that we do not know. In fact, we clearly do not understand even many of the basic factors in human aging (Partridge and Prowse 1994). Yet one can look forward to future research pointing further in the direction of the tenability of multicentennial human life spans. We may be able to understand better why we no longer see Methuselah-like life spans--but why those life spans were once a reality.

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Topics: Amazing but true, biological enigmas, Biblical life spans, gerontological research, secrets of ageing, oldest living people, maximum human life span, medical mysteries, enigmas in biology