The Faustian Myth, Google, and You

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Faust was a 16th-Century practitioner of arcane magical arts who reportedly sold his soul to the Devil to gain youth, knowledge, and (implicitly) immortality. I learned all that by Googling his name. Google's mantra used to be "Don't Be Evil," but lately it has morphed into something more like "Don't Make Waves." Google doesn't like its boat rocked, now that it's steaming full-speed ahead in a Calico craft toward a Faustian bargain with the Prince of Darkness himself. Google's insiders, in common with other Silicon Valley billionaires, wish to become immortal. Problem is, they've already paid Lucifer handsomely by instituting an intellectually constraining corporate monoculture; but Beelzebub, being a mythic entity, will never deliver.

The Devil, as they say, is in the details. As nutritional guru Bill Sardi pointed out recently in an article published on www.LewRockwell.com, billionaires want to invent an anti-aging pill but have no idea how to do it. That's partly because the science isn't settled. Quite a few theories of aging exist, many of which are mutually compatible because they cover different aspects of the same underlying problem. It's like the group of blind men trying to describe an elephant. Lacking a sufficiently all-encompassing grasp of the problem, plus disdaining diversity of thought (evident in their recent firing of engineer James Damore), the Google moguls will be unlikely to achieve what they yearn for.

Aging: What It Is, and Isn't

Let's help them. First: aging is a universal degenerative process among eukaryotic organisms (like us animals) that renders them progressively less able to cope with environmental stress, and ends in the death of the individual. The math behind it was elucidated by Benjamin Gompertz in 1825, who found empirically that, after infancy, as age increases, mortality increases exponentially. The doubling time for human mortality is approximately 7 years. However, this "natural" exponential mortality curve can be modified by changing the environment. In lab animals coddled under near-ideal conditions, the survival curve is almost rectangular: nearly 100% survive to a species-specific age, when the entire cohort dies off within a very short time. (However, all reproductive cells violate that pattern, having existed in an unbroken line since complex life first appeared.)

Second: "Aging" is not the effects it produces, but the ***cause*** of such effects. Slathering on skin cream reduces wrinkles, but doesn't stop the skin's aging. Removing calcium and other accumulated minerals by chelation may be healthful, but aging continues unabated. We need fewer theories of aging, but relatively more comprehensive ones.

An ideal theory would embody a “choke point,” a final common pathway of metabolism without which cells cannot function at all.

Careful What You Wish For

As it happens, such a choke point was reported nearly half a century ago by Johnson and Strehler of the University of Southern California. It involves the facts that all cells need to manufacture proteins to survive, but a key element in that process dwindles away with age. It’s called ribosomal RNA (rRNA), and without it no cell can make any kind of protein – not enzymes, nor antibodies, nor proteins for cell repair and replacement. The afflicted cell dies.

Evidently all newly born, hatched, or sprouted complex entities start life with a full set of genes for rRNA, but progressively more of those are lost over time due to copying errors. The effect was first discovered in dogs’ brain cells and confirmed fairly soon afterward by Strehler and co-workers in human heart and brain cells. Similar in some ways to the currently popular short-telomeres theory for dividing cells only, the rRNA diminution theory is nevertheless more encompassing because it accounts for lost function in heart and brain cells, which don’t divide. In dogs’ brains the rate of decline was faster, corresponding to “dog years.”

Bernie Strehler was a giant in the field of experimental gerontology, a persuasive proponent for establishing the National Institute of Aging, and my friend. We spent many hours discussing aging and its possible mitigation by human intervention. Bernie always regarded his discovery of rDNA loss as “very disappointing” because he could imagine no way to intervene in the process. It would have involved tinkering with still-poorly understood aspects of the genetic subroutine that generates reproductive cells.

Discoveries of the New Millennium

Fast forward to 2011: Elçin Ünal, a post-doctorate student in Angelika Amon’s lab at MIT, discovers that formation of reproductive cells erases damage in cells caused by aging, and resets the lifespan. Of course, this was found in simple yeast cells, not in our own; but some life processes are so basic that they’ve been “evolutionarily conserved” (PC for “can’t evolve”) over great eons of time. The master switch that resets the aging clock is a protein called Ndt80. It functions to turn on many genes. One of its effects is to reverse defective metabolism of the rDNA that codes for rRNA. Even a brief exposure to Ndt80 bestowed a longer span of cell divisions upon aged yeast cells. This is likely the first time rejuvenation has ever been achieved scientifically.

By some cosmic (or Karmic) irony, Dr. Amon’s lab receives major funding from billionaire David Koch, who’ll perhaps have dibs on some of the lab’s new technology. Koch’s right-libertarian politics differ as much from Google’s left-authoritarian ones as Betelgeuse differs from beetle juice.

More recently, adult stem cells from female mice have been coaxed to turn into eggs that can give rise to fertile offspring. Thus, the genetic program of the reproductive cells,

resident but inactive in all our cells, must be accessible to "hacking" of adults' stem cells (and maybe other kinds).

Are there any "experiments of nature" that show deferred aging against a background of intense egg formation? Yes. The queens of social insects like bees, ants, and termites can live 10s to 100s of times longer than the workers and similar-appearing insects of other species. King termites get that boost, too. Given the fact that brief exposure to Ndt80 extends life of aged yeast, might the continuous bathing of body cells in potent transcription factors (like Ndt80) confer the insects' observed longevity?

Hacking the Genome

One word missing from all the hoopla over aging is ***cybergenomics***. Like the word "ain't", "cybergenomics" ain't in the dictionary – but it will be someday. It means treating genetic code like computer code: both are, after all, sets of instructions encoded in a linear array of symbols. (Genetic encoding is more context-sensitive and tolerant of errors.) Presumably the genome's code is bound by the same rules that constrain ordinary computer programs. Thus, it shouldn't be possible for reproductive cells to output limitless copies of their own source code – but they do anyway. Perhaps they have evolved their source code to be arranged in a special, self-referential manner that software engineers call a quine (after American philosopher W.V. Quine). Other "trick" things to look at include palindromic code, RNAi, and long noncoding nucleic acid sequences – all of which might be within Google's compass if only its managers would quit firing software engineers who, as Steve Jobs would have put it, "think different."

To sum up: Billionaire elitists in Silicon Valley and elsewhere hanker after humanity's ancient dream, an end to aging and death. Given the present gaps in scientific knowledge and the vagaries of relevant corporate cultures, their willful wishes may amount to will-o'-the-wisps. Google's corporate culture especially seems inimical to creative, outside-the-box thinking. A corporate monoculture with little tolerance for diversity of thought and expression treads a downward path to death by cerebral stenosis. Here, the "Don't Be Evil" folks aren't being evil, but just kind of immoral. But remember, Google and Calico are part of Alphabet Inc. So, the twain could just borrow a "t" from Alphabet's character set, slip it into the word "immorality," and thus achieve "immortality." Plausibly, that's the only way they'll get it.

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