The Truth About Human Aging Intervention

A4M Official Position Statement
Issued June 2002 and November 2002;
with Excerpts from "Anti-Aging Medicine at Ten Years,"
Anti-Aging Medical News, Summer 2003

Introduction

In June 2002, a group of 51 gerontologists and biogerontologists published a "Position Statement on Human Aging" in *Scientific American* (primary authors Olshansky SJ, Hayflick L, and Carnes B.).

In response to the afformentioned article, and other assorted commentary from the gerontological establishment, the 12,500 members of the A4M issues its Official Position Statement on "The Truth on Human Aging Intervention," representing the position of clinical practitioners around the world who are involved in delivering advancing safe and efficacious anti-aging medical care.

Fallacies and Facts

GERONTOLOGICAL FALLACY*: "Past and anticipated advances in [aging] interventions only influence the manifestations of aging--not aging itself. The biomedical knowledge required to modify the processes of aging that lead to age-associated pathologies confronted by geriatricians does not currently exist."

A4M FACTUAL RESPONSE: In the April 10th issue of the *Journal of the American Medical Association*, the Alliance for Aging Research reports that "There is little research on the aging process itself: less than 1% of the entire budget of the National Institutes of Health (NIH) is devoted to studying the biology of aging." [Mitka M, "As Americans Age, Geriatricians Go Missing," *JAMA*, 287(14); April 10, 2002.] Over the next five years, the NIH's budget will be doubling: in 2003, the NIH will receive $27.3 billion. Of this $3.7 billion increase over fiscal year 2002, zero dollars have been earmarked for clinical anti-aging research. Moreover, the National Institute on Aging (NIA), the NIH branch tasked with "understanding the nature of aging," has received over $10.3 billion since its creation in 1974, yet NIA admits that "despite increasing funds to make awards, the Institute has experienced a decline in success rate [ie, the payoff of research versus cost of project awards]." ["Overall Funding Policies, National Institute on Aging, www.nia.nih.gov/funding;/policies/gfunding.html].

We propose that the NIA rethink its funding strategy in order to welcome eager, independent anti-aging researchers who lack the bloated-budget thinking of their gerontology counterparts. At an "average NIA grant of $345,000 to $370,000," A4M submits that over 2,000 anti-aging research projects -- yielding near-term, applicable results for aging intervention -- could be funded by the $880 million appropriated to NIA for 2002.

* Statement as published in Olshansky SJ, Hayflick L, and Carnes B., "The Truth About Human Aging," *Scientific American*, June 2002.

GERONTOLOGICAL FALLACY*: "Eliminating all aging-related causes of death currently written on the death certificates of the elderly will not increase human life expectancy by more than 15 years."
A4M FACTUAL RESPONSE: In 1900, the leading causes of death, namely tuberculosis, pneumonia, and diarrhea/enteritis, reflected lack of sanitation and effective infection control. Life expectancy in 1900 stood at just 47.3 years. In 1997, the leading causes of death, namely heart disease, cancer, and stroke -- collectively, the "degenerative diseases of aging," Life expectancy in 1997 stood at 79 years (women) and 74 years (men). The US Department of Health and Human Services projects that life expectancy in 2050 will be 84.3 years for women and 79.7 years for men. ["Healthy People 2010," U.S. Department of Health and Human Services. Washington DC: January 2000.] A4M believes that at least another ten years can be added to life expectancy when factoring in the impact of biotechnology. This position is supported by the Global Business Network (GBN), a worldwide membership organization engaged in a collaborative exploration of the future. GBN Chairman Peter Schwartz has remarked that " Science and medicine will not only extend more people's lives to … 120 years, but advances in biology will lengthen human life even beyond that. If we look at the current work on stem cells and phenomena like telomerase … we find we're learning a great deal about the control mechanisms for aging. It's very likely that over the next 25 years, society will see serious and effective medical intervention in the aging process -- people undergoing such therapy will keep looking and feeling and acting younger than their calendar age. The prospect of individuals living significantly longer than the current norm will begin to open up. In fact, looking at historical trends, one finds that over the past century, we nearly doubled our lifespan, the average having gone from about 45 to 85. There's no reason to imagine that we won't do at least as much in the next century. If you double 85, you're at 170 -- so my bet is actually conservative." ["Wanna Bet?," *Wired* May 2002, p. 131.]

GERONTOLOGICAL FALLACY*: "Relatively little evidence from human studies that supplements … lead to a reduction in either the risk of these conditions or the rate of aging."
A4M FACTUAL RESPONSE: In April 2002, Dr. Bruce Ames et al of the University of California/Berkeley reported in *The American Journal of Clinical Nutrition* that they were able to treat more than 50 genetic diseases with high doses of vitamins. The team also believes that there may be many more diseases similarly treatable -- including aging, because the process involves biochemical deficiencies that may be modulated with vitamin therapy. The researchers suggest that vitamins, which are converted to coenzymes, team up with enzymes to perform various essential metabolic functions. Saturating the body with vitamins increases coenzyme levels and provides the necessary nutrients to conduct cellular processes properly. Commenting on the findings, Dr. Ames states that "there is potentially much benefit ... in trying high-dose nutrient therapy, because of the nominal cost, ease of application, and low level of risk." Dr. Ames adds that he "suspect[s] the big impact [of dietary supplementation] is going to be in aging." [Ames BN, Elson-Schwab I, Silver I, *Am J Clinical Nutrition*, April 2002, 75: 616-658.]

GERONTOLOGICAL FALLACY*: "No product currently sold has been demonstrated to reverse aging. No hormone, has been proved to slow, stop or reverse aging. Growing younger is a phenomenon that is currently not possible."

A4M FACTUAL RESPONSE: We reference the 1990 landmark study on growth hormone by Daniel Rudman et al, in which the researchers state "the effects of six months of human growth hormone on lean body mass and adipose-tissue mass were equivalent in magnitude to the changes incurred during 10 to 20 years of aging." [Rudman D, Feller AG, Nagraj HS, Lalitha PY, Goldberg AF, Schlenker RA, Cohn L, Rudman IW, Mattson DE, "Effects of human growth hormone in men over 60 years old," *N Engl J Med* 1990 Jul 5; 323(1): 1-6]. More recently, in April of this year, scientists from the US National Institute of Neurological Disorders and Stroke, a division of the National Institutes of Health, reported earlier this year in the *Proceedings of the National Academy of Sciences* that feeding fruit flies throughout adulthood with the drug 4-phenylbutyrate (PBA) can significantly increase lifespan, without diminution of mobility, stress resistance, or reproductive ability. Moreover, treatment for a limited period, either early or late in adult life, was also found to be effective. PBA extended the maximum lifespan of fruit flies by over 50% and their average lifespan by one-third. [Kang HL, Benzer S, Min KT, "Life extension in Drosophila by feeding a drug," *Proc Natl Acad Sci U S A*. 2002 Jan 22; 99(2): 838-43]

GERONTOLOGICAL FALLACY*: "It is unlikely that scientists will be able to influence aging directly through genetic engineering because … there are no genes directly responsible for the processes of aging."

A4M FACTUAL RESPONSE: In February 2002, Icelandic biotechnologists announced that they had isolated the Methuselah gene, a stretch of DNA that offers a protective defense against old age. The researchers located the gene after comparing the records of 1,200 people who lived for 90 years or longer with that of a similar number of people with average lifespans. Results showed that those who lived longest were more closely related than those who lived for an average lifetime, and that a single gene appeared to be responsible for protecting the nonagenarians from the ravages of old age. Kari Stefansson, the Chief Executive of DeCode Genetics, the company behind the discovery, believes that the discovery will help scientists to develop life-lengthening drugs, saying: "There is no reason why we cannot do this. We know the location of this gene. Soon we will study its exact DNA sequence and work out how it works in the body. You can then think of making drugs that could replicate its action."

This discovery follows new data released by the Harvard Centenarian Study, which recently found that 100% of the centenarians they studied had Methuselah-type genes, which appeared to protect them from age-related conditions such as cancer, dementia and heart disease. Many had also inherited a gene dubbed the longevity gene. The researchers also found that the children of centenarians were likely to live 10 to 15 years longer than the norm, and their siblings were four times more likely than average to live to see their 90^{th} birthday. Remarks Thomas Perls of the Harvard study, "An average set of genes will allow you to live to your mid to late eighties. To get another 20 healthy years, you have these disease-resistant genes." [Dalton A, "Scientists find key to eternal life," *The Scotsman*, February 4, 2002.]

GERONTOLOGICAL FALLACY*: "Suggestions have been made that the complete replacement of all body parts with more youthful components could increase longevity. Though possible in theory, it is highly improbable that this would ever become a practical strategy to extend length of life."
A4M FACTUAL RESPONSE: Replacement parts for worn out or damaged human organs are presently helping people to extend both total and healthy lifespan. In the not-so-distant future, refinement of today's organ replacement technologies will extend total lifespan even farther. The A4M is not the only medical organization putting forth this position. At its annual meeting in 2000, the American College of Cardiology predicted: "It is the year 2024. You are 75 years old, and you discover that a man next to you on an airplane has a pig heart, and his arteries are swarming with "smart dust" that sends continuous reports on his condition to his doctor's computer. That's not so strange, because you have a pig heart, too. And by 2049, when you are 100, many of your organs will be replaced. Plus you'll feel better than you did at 50 because "nanolabs" in your blood can manufacture and supply drugs whenever they are needed." [Raeburn R, "Oh, so you have a pig's heart too," *Business Week*, March 27, 2000].

GERONTOLOGICAL FALLACY*: "Optimum lifestyles, including exercise and a balanced diet along with other proven methods for maintaining good health, contribute to increases in life expectancy by delaying or preventing the occurrence of age-related diseases. There is no scientific evidence, however, to support the claim that these practices increase longevity by modifying the processes of aging."
A4M FACTUAL RESPONSE: In an important study of 6,2000 men by researchers from the Veterans Affairs Palo Alto Health Care System/Stanford University published in 2002, physical fitness was determined to be more important a factor in longevity than high blood pressure, sky-high cholesterol levels, or bad habits such as smoking. In fact, the researchers found that men with the lowest exercise capacity were roughly four times more likely to die during the study than the fittest participants. Altogether, physical fitness was shown to have a bigger impact on the risk of death than all of the well-publicized heart disease risk factors. [*New England Journal of Medicine* 2002; 346:793-801, 852-853.]

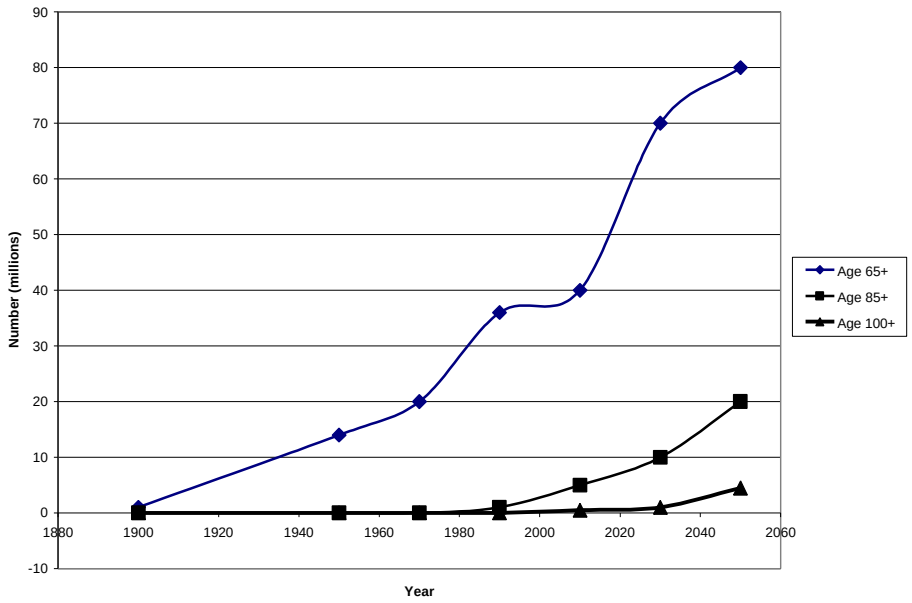
The net result of risk factor intervention or biotechnological applications from genetic engineering to stem cell research is the same: a prolonged disease-free lifespan. Anti-aging medicine is a medical specialty founded on the application of advanced scientific and medical technologies for the early detection, prevention, treatment, and reversal of age-related dysfunction, disorders, and diseases. Thus, anti-aging medicine considers the disabilities associated with normal aging to be caused by physiological dysfunction which in many cases are ameliorable to medical treatment. Whether it is by delaying or preventing the occurrence of age-related diseases, or modifying the processes of aging, the net result of anti-aging medicine is to increase the healthy human lifespan.

GERONTOLOGICAL FALLACY*: "Despite intensive study, scientists have not been able to discover reliable measures of the processes that contribute to aging. For these reasons, any claim that a person's biological or "real age" can currently be measured, let alone modified, by any means must be regarded as entertainment, not science."
A4M FACTUAL RESPONSE: With a major mission objective to "support and conduct high-quality research on aging processes and age-related diseases," is it not requisite that NIA elucidates the markers of biological age? In 1999, the A4M launched the LEXCORE research study (www.lexcorelink.net). LEXCORE is an independently-funded longitudinal study of aging that employs a large-scale, cross-population data acquisition strategy in order to obtain a depth and breadth of data collection harvesting key indicators of health. Sixty-five sites around the world are participating in this research effort. A4M anticipates that LEXCORE will yield clear definitions for the parameters of biological age within a very short period once critical mass of data is achieved. Once these markers are established, correlations to efficacious interventions for aging may readily be established.

GERONTOLOGICAL FALLACY*: "Dramatic claims made by those who advocate antiaging medicine .. .are … not supported by scientific evidence, and it is difficult to avoid the conclusion that these claims are intentionally false, misleading or exaggerated for commercial reasons."
A4M FACTUAL RESPONSE: A4M is a non-profit organization, and does not promote or endorse any specific treatment nor does it sell or endorse any commercial product. A4M agrees that there are a few less-than-reputable vendors involved in the anti-aging industry. To-date, A4M has launched three important initiatives to combat this problem:

- In 1999, the A4M created the Consumer Education & Research Council, which seeks to expose anti-aging product marketing practices that may be misleading or deceptive and educate consumers about what they should expect from anti-aging healthcare products.
- In an ongoing effort to warn the public of dubious marketing efforts of fraudulent and unscrupulous vendors, the A4M regularly issues advisories at our website (www.worldhealth.net). In July 2001, A4M issued an alert titled "Beware Bait-and-Switch Nutritionals Marketing that Misrepresents Scientific Growth Hormone Research," to warn the public of misleading claims being made by nutritional HGH manufacturers and vendors attempting to confuse research documenting injectable HGH replacement therapy as validating nutritional products.
- In 2002, the A4M established the Panel to Establish Guidelines for Anti-Aging Product Marketing, a committee of medical ethicists, physicians, scientists, and business leaders who will promulgate ethical guidelines for self-regulation of the anti-aging marketplace.

GERONTOLOGICAL FALLACY*: "There are no lifestyle changes, surgical procedures, vitamins, antioxidants, hormones or techniques of genetic engineering available today that have been demonstrated to influence the processes of aging."
A4M FACTUAL RESPONSE: If we are to believe the gerontological propaganda that nothing whatsoever has influenced the processes of aging, how can the following trends in the growth of the population brackets age 65+, 85+, and 100+ be explained:



Created from data from Federal Interagency Forum on Aging-Related Statistics, "Older Americans 2000: Key Indicators of Well-Being," at www.agingstats.gov/chartbook2000; *Centenarians in the United States -- Current Population Reports 1990: Special Studies,Publication P23-199RV,* U.S. Department of Health and Human Services, July 1999.

Moreover, the United Nations Second World Assembly on Ageing that took place in April 2002 predicts that:

- One out of every ten persons is now 60 years or older; by 2050, one out of every three persons will be age 60+.
- The oldest old (age 80 and over) is the fastest growing segment of the older population. Currently making up 100% of the 60+ age group, this segment will grow to 19% by 2050.
- The number of centenarians (aged 100 years or more) is projected to increase fifteen-fold, from approximately 145,000 in 1999 to 2.2 million by 2050.

[UN Press Release, April 9, 2002, at www.irna.com]

If -- as the gerontological establishment purports -- nothing whatsoever influences the processes of aging, how are millions of people around the world living longer and healthier extended lifespans, and why would the United Nations make these predictions for fifty years from now?

GERONTOLOGICAL FALLACY: "What we anticipate is that everyone alive today will be long dead before a life expectancy of 100 is achieved -- if it ever is."

S. Jay Olshansky, in "100-Year Life Expectancy May Be 500 Years Off," *Chicago Tribune*, Feb. 19, 2001

"In research published in Science in 1990, Olshansky et al … concluded that the practical upper limit to life expectancy is 85 years -- 88 for women and 82 for men."

Press Release from University of Illinois at Chicago Feb. 18, 2001 on S. Jay Olshansky, *Science*, Feb. 23, 2001

A4M FACTUAL RESPONSE:

Olshansky, who since 1990 has presented historical statistical analyses in which it is purported that the elimination of cancer, heart disease, and diabetes would increase life expectancy only to about age 85 -- and would thereby proliferate disabling conditions such as arthritis, Alzheimer's disease, and vision and hearing losses in advanced age, we remind our colleagues of a scientific study published by the same publication in which Olshansky's February report appears. In "Increase in Maximum Life-Span in Sweden, 1861-1999" (*Science* Sep 29 2000: 2366-2368), the study's authoring team, demographers J. R. Wilmoth and L. J. Deegan of the University of California/Berkeley along with H. Lundström, and S. Horiuchi, shares that in Sweden, **the maximum age at death has risen from 100 years during the 1860s to about 108 years during the 1990s.** The team cites "an intensification of efforts … to prevent or even cure ailments such as coronary heart disease, stroke, and cancer" has profoundly contributed to "the more rapid rise in the maximum age since 1969."

GERONTOLOGICAL FALLACY: "Regardless of how many lifestyle improvements we make, vitamins we ingest, or hormones we inject, the changes of life expectancy at birth rising to 100 years or beyond are slim to nil."

Press Release from University of Illinois at Chicago Feb. 18, 2001 on S. Jay Olshansky, *Science*, Feb. 23, 2001

A4M FACTUAL RESPONSE:

"'Researchers used to believe the older you get, the sicker you get,' says Harvard Medical School physician Thomas T. Perls. 'That's completely wrong.' **Starting healthy habits now can add years later on.** Do you smoke? Keep a positive attitude? Limit red meat? **The answers to such questions may affect your likely expiration date."** Those of us with ***average genes*** **and** ***healthy habits*** **can expect to live until about 85."**

"How long have you got," *Scientific American--The Quest to Beat Aging*, Summer 2000

"Antiaging therapies may soon add even more candles to the cake, says zoologist Steven N. Austad of the University of Idaho. 'The first 150-year-old person is probably alive right now,'" Austad predicts."

"How long have you got," *Scientific American--The Quest to Beat Aging*, Summer 2000

GERONTOLOGICAL FALLACY:
"Our [human] bodies evolved to survive long enough to reproduce and raise our young. 'Had our bodies been crafted for extended operation, we would have fewer flaws capable of making us miserable in our later days."

Press Release from University of Illinois at Chicago "UIC Expert Tinkers with Evolution to Create 'Built-to-Last' Human, Feb. 9, 2001

A4M FACTUAL RESPONSE:
"Thanks to modern technology and medicine, people have taken much more control over their differential survival. Ills are not the barriers they once were. Our technology may exert the greatest influence."

Board of Editors, "The Future of Human Evolution," *Scientific American*, March 2001

GERONTOLOGICAL FALLACY: "Future gains in life expectancy will … be measured in days or months rather than years. The next quantum leap in life expectancy … can occur only if 'biomedical researchers can discover how to modify the aging process and make such a discovery widely available to the entire population."

Press Release from University of Illinois at Chicago Feb. 18, 2001 on S. Jay Olshansky, *Science*, Feb. 23, 2001

A4M FACTUAL RESPONSE:
The American Academy of Anti-Aging Medicine offers a hopeful and attainable model for medicine in the new millennium founded on the dramatic advancements offered by the biotech revolution delivering a continued and expanding arena of discovery and advancement in our understanding of ways to mitigate age-related disability and disease. Conceived by A4M, **technodemography is the application of modern biotechnology to the issues of aging diagnosis, sprevention, and intervention, such that one may extrapolate future progress in human aging based on the application of innovative medical interventions on aging.** This concept may be illustrated by The Longevity Link, a novel representation of the impact of five key biomedical technologies on gains in human longevity:

$$l \propto \sum_{k=1}^{5} T_k^{\frac{t}{3.5}}$$

where:
λ = human longevity
T_k = {
stem cells, giving rise to a supply of human cells, tissues, and organs for use in acute emergency care as well as treatment of chronic, debilitating disease
cloning, a technique holding tremendous promise in producing consistent organs, tissues, and proteins for biomedical use and transplant in humans
nanotechnology, enabling scientists to use tiny tools to manipulate human biology at its most basic levels
artificial organs, making plentiful replacement body parts available
nerve impulse continuity (brain/spinal cord), enabling nerve signal transmission to be maintained without interruption despite physical trauma
}technological knowledge
and τ = year (after 2000 A.D.), where
the exponent τ /3.5 represents the doubling time of medical knowledge and technology every 3.5 years

A4M's technodemographers predict that these advancements will receive widespread application and availability by the year 2029.

Today, medicine is at its most important crossroads it has encountered. An artificial impasse constructed by a traditional, antiquated gerontological establishment seeks to obfuscate truth and science with politics and propaganda. **Remember:**

FACT: **No lawsuits for wrongful death have been confirmed, determined, directly proven, or associated with** a physician for practicing anti-aging medicine.

FACT: **State licensing boards perceive innovative physicians** -- such as those practicing anti-aging medicine, as **ripe targets for administrative actions,** to-date being unsuccessful in proving any actual medical practices of harm to patients.

FACT: **Hormone replacement therapy,** performed judiciously and administered in physiological doses by a qualified anti-aging physicians, is **well researched** and **scientifically documented** to improve health and **has not been directly confirmed to cause any unhealthy adverse effects, such as cancer.**

FACT: **Anti-aging medicine** is a **multi-disciplinary model** for **wellness-based healthcare,** uniting physicians and scientists across specialties in a **spirit of cooperative research and application** to promote a **scientifically-validated whole-body approach** to individual medical care.

FACT: **Anti-aging medical therapeutics and interventions** are taught as part of **postgraduate medical education** at many medical universities around the world.

FACT: **Anti-aging medical education** qualifies as Continuing Medical Education (CME) by the **American Medical Association (AMA**), **the American Osteopathic Association (AOA), Medical Media Communications**, and overseas medical societies such as the **German Endocrinological Society.**

Concluding Remarks

As the goal of achieving healthy, productive, extended human lifespans grows near, those clinicians and scientists who have dedicated their professional lives to the pursuit of anti-aging in the form of safe, effective, and progressive interventions as advanced by the A4M have drawn much attention from the "biogerontologists" –- biologists who research the processes of aging. As described by Dr. Robert Binstock and colleagues from the School of Medicine's Aging, Health, and Society Department at Case Western Reserve University, the contemporary prominence of the anti-aging movement "threaten[s] biogerontological researchers and practitioners." [Binstock RH. "The war on 'anti-aging medicine,'" The Gerontologist, 43(1), 4-14.] According to Dr. Binstock, much of biogerontology's territorialism towards the study of aging stems from "the marginal status" of that field that required a dozen years of political lobbying in the 1970s and 1980s to overcome. Yet, Dr. Binstock warns that "through their attack on anti-aging medicine, [biogerontologists] may be shooting themselves in the foot." Instead, Dr. Binstock advocates "public dialogue … to ensure that everyone benefits from [aging interventions]."

A4M agrees that dialogue, not diatribe, will collectively advance the pursuit of the healthy extended human lifespan in a much more productive fashion. The mechanisms of aging intervention and clinical methods to attack aging-related disorders are degenerative metabolic processes that lead inevitably to disease and, finally, to death. Were intellectual honesty to prevail, all those involved in aging research and policymaking would admit that aging is a treatable condition. It is together, in a spirit of cooperation, that the all researchers and clinicians

interested in improving the condition of the aging human population can move forward to the ultimate mutual goal of eliminating aging-related diseases within our lifetime.

History is replete with examples of medical pioneers whose innovations and foresight were trivialized, ignored, challenged, or violently opposed by the establishment, only to ultimately become accepted by society at-large. Leopold Auenbrugger was ridiculed for percussing and auscultating his patients' chests; Ignaz Semmelweiss' recommendation for doctors to wash their hands before each patient landed him in a mental asylum; and more recently, cardiologists denied Nathan Pritikin's program for dietary modification to modulate cardiovascular risk until after his death. Given time and objective, undeniable evidence, scientific truths are ultimately borne out. In the words of Dr. Augenbrugger, "It has always been the fate of those who have illustrated the arts and sciences by their discoveries to be beset by envy, malice, hatred, destruction, and calumny."