

# THE SUPERLIST OF FUN LINES AND FAMOUS QUOTATIONS Scientific Quotations

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Compiled by Christer Sundqvist 1987-2007

Christer Sundqvist  
Neptunuksenkatu 3  
FIN-21600 PARAINEN  
FINLAND  
TEL: int +358-40-7529274  
e-Mail: [christer.sundqvist@wakkanet.fi](mailto:christer.sundqvist@wakkanet.fi)

Put your hand on a hot stove for a minute, and it seems like an hour. Sit with a pretty girl for an hour, and it seems like a minute. That's relativity. *Albert Einstein* (1879-1955)

## Scientific Quotations

A clever person solves a problem. A wise person avoids it. *Albert Einstein* (1879-1955)

A complete theory of evolution must acknowledge a balance between “external” forces of environment imposing selection for local adaptation and “internal” forces representing constraints of inheritance and development. Vavilov placed too much emphasis on internal constraints and downgraded the power of selection. But Western Darwinians have erred equally in practically ignoring (while acknowledging in theory) the limits placed on selection by structure and development - what Vavilov and the older biologists would have called “laws of form.” *Stephen Jay Gould* (1941-2002)

A conflict arises when a religious community insists on the absolute truthfulness of all statements recorded in the Bible. This means an intervention on the part of religion into the sphere of science; this is where the struggle of the Church against the doctrines of Galileo and Darwin belongs. On the other hand, representatives of science have often made an attempt to arrive at fundamental judgments with respect to values and ends on the basis of scientific method, and in this way have set themselves in opposition to religion. These conflicts have all sprung from fatal errors. *Albert Einstein* (1879-1955)

A contradiction (between science and religion) is out of the question. What follows from science are, again and again, clear indications of God's activity which can be so strongly perceived that Kepler dared to say (for us it seems daring, not for him) that he could ‘almost touch God with his hand in the Universe.’ *Walter Heitler*

A cynic is a man who, when he smells flowers, looks around for a coffin. *Henry Louis Mencken* (1880-1956)

- A doctor's reputation is made by the number of eminent men who die under his care. *George Bernard Shaw* (1856-1950)
- A fire eater must eat fire even if he has to kindle it himself. *Isaac Asimov* (1920-1992)
- A fool who, after plain warning, persists in dosing himself with dangerous drugs should be free to do so, for his death is a benefit to the race in general. *Henry Louis Mencken* (1880-1956)
- A fool's brain digests philosophy into folly, science into superstition, and art into pedantry. Hence University education. *George Bernard Shaw* (1856-1950)
- A government, at bottom, is nothing more than a gang of men, and as a practical matter most of them are inferior men...Government is actually the worst failure of civilized man. There has never been a really good one, and even those that are most tolerable are arbitrary, cruel, grasping and unintelligent. Indeed, it would not be far wrong to describe the best as the common enemy of all decent citizens. *Henry Louis Mencken* (1880-1956)
- A great nation is any mob of people which produces at least one honest man a century. *Henry Louis Mencken* (1880-1956)
- A happy man is too satisfied with the present to dwell too much on the future. *Albert Einstein* (1879-1955)
- A hot topic of late, expressed most notably in Bernie Siegel's best-selling books, has emphasized the role of positive attitude in combating such serious diseases as cancer. From the depths of my skeptical and rationalist soul, I ask the Lord to protect me from California touchie-feeliedom. *Stephen Jay Gould* (1941-2002)
- A hundred times every day I remind myself that my inner and outer life depends on the labors of other men, living and dead, and that I must exert myself in order to give in the measure as I have received and am still receiving. *Albert Einstein* (1879-1955)
- A life spent in making mistakes is not only more honorable but more useful than a life spent doing nothing. *George Bernard Shaw* (1856-1950)
- A little knowledge is dangerous. So is a lot. *Albert Einstein* (1879-1955)
- A man must learn to understand the motives of human beings, their illusions, and their sufferings. *Albert Einstein* (1879-1955)
- A man who is convinced of the truth of his religion is indeed never tolerant. At the least, he is to feel pity for the adherent of another religion but usually it does not stop there. The faithful adherent of a religion will try first of all to convince those that believe in another religion and usually he goes on to hatred if he is not successful. However, hatred then leads to persecution when the might of the majority is behind it. *Albert Einstein* (1879-1955)
- A man's interest in the world is only an overflow from his interest in himself. *George Bernard Shaw* (1856-1950)
- A man's value to the community depends primarily on how far his feelings, thoughts, and actions are directed towards promoting the good of his fellows. We call him good or bad according to how he stands in this matter. It looks at first sight as if our estimate of a man depended entirely on his social qualities. *Albert Einstein* (1879-1955)
- A man's worst difficulties begin when he is able to do as he likes. *Thomas Henry Huxley* (1825-1895)
- A mathematician is a blind man in a dark room looking for a black cat that doesn't exist. *Charles Darwin* (1809-1882)
- A Native American elder once described his own inner struggles in this manner: Inside of me there are two dogs. One of the dogs is mean and evil. The other dog is good. The mean dog fights the good dog all the time. When asked which dog wins, he reflected for a moment and replied, The one I feed the most. *George Bernard Shaw* (1856-1950)
- A newspaper is a device for making the ignorant more ignorant and the crazy crazier. *Henry Louis Mencken* (1880-1956)

- A people that were to honor falsehood, defamation, fraud, and murder would be unable, indeed, to subsist for very long. *Albert Einstein* (1879-1955)
- A person starts to live when he can live outside himself. *Albert Einstein* (1879-1955)
- A person who is religiously enlightened appears to me to be one who has, to the best of his ability, liberated himself from the fetters of his selfish desires and is preoccupied with thoughts, feelings, and aspirations to which he clings because of their superpersonal value. It seems to me that what is important is the force of this superpersonal content and the depth of the conviction concerning its overpowering meaningfulness, regardless of whether any attempt is made to unite this content with a divine Being, for otherwise it would not be possible to count Buddha and Spinoza as religious personalities. Accordingly, a religious person is devout in the sense that he has no doubt of the significance and loftiness of those superpersonal objects and goals which neither require nor are capable of rational foundation. They exist with the same necessity and matter-of-factness as he himself. In this sense religion is the age-old endeavor of mankind to become clearly and completely conscious of these values and goals and constantly to strengthen and extend their effect. If one conceives of religion and science according to these definitions then a conflict between them appears impossible. For science can only ascertain what is, but not what should be, and outside of its domain value judgments of all kinds remain necessary. *Albert Einstein* (1879-1955)
- A scientist is happy, not in resting on his attainments but in the steady acquisition of fresh knowledge. *Max Planck* (1858-1947)
- A scientist worthy of the name, above all a mathematician, experiences in his work the same impression as an artist; his pleasure is as great and of the same Nature. *Jules Henri Poincaré* (1854-1912)
- A subtle thought that is in error may yet give rise to fruitful inquiry that can establish truths of great value. *Isaac Asimov* (1920-1992)
- A theory that you can't explain to a bartender is probably no damn good. *Ernest Rutherford* (1871-1937)
- A very sincere and serious freshman student came to my office with a question that had clearly been troubling him deeply. He said to me, "I am a devout Christian and have never had any reason to doubt evolution, an idea that seems both exciting and well documented. But my roommate, a proselytizing evangelical, has been insisting with enormous vigor that I cannot be both a real Christian and an evolutionist. So tell me, can a person believe both in God and in evolution?" Again, I gulped hard, did my intellectual duty, and reassured him that evolution was both true and entirely compatible with Christian belief - a position that I hold sincerely, but still an odd situation for a Jewish agnostic. *Stephen Jay Gould* (1941-2002)
- A world of facts lies outside and beyond the world of words. *Thomas Henry Huxley* (1825-1895)
- Agnosticism simply means that a man shall not say he knows or believes that for which he has no grounds for professing to believe. *Thomas Henry Huxley* (1825-1895)
- Alcohol is the anesthesia by which we endure the operation of life. *George Bernard Shaw* (1856-1950)
- All good moral philosophy is but the handmaid to religion. *Sir Francis Bacon* (1561-1626)
- All government, in its essence, is organized exploitation, and in virtually all its existing forms it is the implacable enemy of every industrious and well-disposed man... The typical politician is not only a rascal but also a jackass, so he greatly values the puerile notoriety and adulation that sensible men try to avoid. *Henry Louis Mencken* (1880-1956)
- All great truths begin as blasphemies. *George Bernard Shaw* (1856-1950)
- All interesting issues in natural history are questions of relative frequency, not single examples. Everything happens once amidst the richness of nature. But when an unanticipated phenomenon occurs again and again - finally turning into an expectation - then theories are overturned. *Stephen Jay Gould* (1941-2002)

All models are wrong, but some are useful. *George Edward Pelham Box* (1919- )

All of the great patriots now engaged in edging and squirming their way toward the Presidency of the Republic run true to form. That is to say, they are all extremely wary, and all more or less palpable frauds. What they want, primarily, is the job; the necessary equipment of unescapable issues, immutable principles and soaring ideals can wait until it becomes more certain which way the mob will be whooping. *Henry Louis Mencken* (1880-1956)

All religions, arts and sciences are branches of the same tree. All these aspirations are directed toward ennobling man's life, lifting it from the sphere of mere physical existence and leading the individual towards freedom. *Albert Einstein* (1879-1955)

All schools, all colleges have two great functions: to confer, and to conceal valuable knowledge. *Mark Twain* (1835-1910)

All science is either physics or stamp collecting. *Ernest Rutherford* (1871-1937)

All scientific men will be delighted to extend their warmest congratulations to Tesla and to express their appreciation of his great contributions to science. *Ernest Rutherford* (1871-1937)

All sorts of computer errors are now turning up. You'd be surprised to know the number of doctors who claim they are treating pregnant men. *Isaac Asimov* (1920-1992)

All versions written for nonscientists speak of fused males as the curious tale of the anglerfish - just as we so often hear about the monkey swinging through the trees, or the worm burrowing through soil. But if nature teaches us any lesson, it loudly proclaims life's diversity. There ain't no such abstraction as the clam, the fly, or the anglerfish. Ceratioid anglerfishes come in nearly 100 species, and each has its own peculiarity. *Stephen Jay Gould* (1941-2002)

Although I am a typical loner in daily life, my consciousness of belonging to the invisible community of those who strive for truth, beauty, and justice has preserved me from feeling isolated. *Albert Einstein* (1879-1955)

Although species may be discrete, they have no immutable essence. Variation is the raw material of evolutionary change. It represents the fundamental reality of nature, not an accident about a created norm. Variation is primary; essences are illusory. Species must be defined as ranges of irreducible variation. *Stephen Jay Gould* (1941-2002)

Although the time of death is approaching me, I am not afraid of dying and going to Hell or (what would be considerably worse) going to the popularized version of Heaven. I expect death to be nothingness and, for removing me from all possible fears of death, I am thankful to atheism. *Isaac Asimov* (1920-1992)

An atom-blaster is a good weapon, but it can point both ways. *Isaac Asimov* (1920-1992)

An autocratic system of coercion, in my opinion, soon degenerates. For force always attracts men of low morality, and I believe it to be an invariable rule that tyrants of genius are succeeded by scoundrels. For this reason I have always been passionately opposed to systems such as we see in Italy and Russia to-day. *Albert Einstein* (1879-1955)

An individual can't be judged by his group mean. *Stephen Jay Gould* (1941-2002)

An old paleontological in joke proclaims that mammalian evolution is a tale told by teeth mating to produce slightly altered descendant teeth. *Stephen Jay Gould* (1941-2002)

And above all things, never think that you're not good enough yourself. A man should never think that. My belief is that in life people will take you at your own reckoning. *Isaac Asimov* (1920-1992)

And, in this case, science could learn an important lesson from the literati - who love contingency for the same basic reason that scientists tend to regard the theme with suspicion. Because, in contingency lies the power of each person, to make a difference in an unconstrained world bristling with possibilities, and nudgable by the smallest of unpredictable inputs into markedly different channels spelling either vast improvement or potential disaster. *Stephen Jay Gould* (1941-2002)

And the human understanding is like a false mirror, which, receiving rays irregularly, distorts and discolors the nature of things by mingling its own nature with it. *Sir Francis Bacon* (1561-1626)

And yet I think that the Full House model does teach us to treasure variety for its own sake - for tough reasons of evolutionary theory and nature's ontology, and not from a lamentable failure of thought that accepts all beliefs on the absurd rationale that disagreement must imply disrespect. Excellence is a range of differences, not a spot. Each location on the range can be occupied by an excellent or an inadequate representative - and we must struggle for excellence at each of these varied locations. In a society driven, often unconsciously, to impose a uniform mediocrity upon a former richness of excellence - where McDonald's drives out the local diner, and the mega-Stop & Shop eliminates the corner Mom and Pop - an understanding and defense of full ranges as natural reality might help to stem the tide and preserve the rich raw material of any evolving system: variation itself. *Stephen Jay Gould* (1941-2002)

Another argument of hope may be drawn from this - that some of the inventions already known are such as before they were discovered it could hardly have entered any man's head to think of; they would have been simply set aside as impossible. For in conjecturing what may be men set before them the example of what has been, and divine of the new with an imagination preoccupied and colored by the old; which way of forming opinions is very fallacious, for streams that are drawn from the springheads of nature do not always run in the old channels. *Sir Francis Bacon* (1561-1626)

Antiessentialist thinking forces us to view the world differently. We must accept shadings and continua as fundamental. We lose criteria for judgment by comparison to some ideal: short people, retarded people, people of other beliefs, colors, and religions are people of full status. *Stephen Jay Gould* (1941-2002)

Anton Chekhov wrote that "one must not put a loaded rifle on stage if no one is thinking of firing it." Good drama requires spare and purposive action, sensible linking of potential causes with realized effects. Life is much messier; nothing happens most of the time. Millions of Americans (many hotheaded) own rifles (many loaded), but the great majority, thank God, do not go off most of the time. We spend most of real life waiting for Godot, not charging once more unto the breach. *Stephen Jay Gould* (1941-2002)

Any fool can know. The point is to understand. *Albert Einstein* (1879-1955)

Any intelligent fool can make things bigger, more complex, and more violent. It takes a touch of genius - and a lot of courage - to move in the opposite direction. *Albert Einstein* (1879-1955)

Anyone who has never made a mistake has never tried anything new. *Albert Einstein* (1879-1955)

APL is a mistake, carried through to perfection. It is the language of the future for the programming techniques of the past: it creates a new generation of coding bums. *Edsger W. Dijkstra* (1930-2002)

As a child, I received instruction both in the Bible and in the Talmud. I am a Jew, but I am enthralled by the luminous figure of the Nazarene. *Albert Einstein* (1879-1955)

As a graduate student at Columbia University, I remember the a priori derision of my distinguished stratigraphy professor toward a visiting Australian drifter... Today my own students would dismiss with even more derision anyone who denied the evident truth of continental drift - a prophetic madman is at least amusing; a superannuated fuddy-duddy is merely pitiful. *Stephen Jay Gould* (1941-2002)

As a nation, we are too young to have true mythic heroes, and we must press real human beings into service. Honest Abe Lincoln the legend is quite a different character from Abraham Lincoln the man. And so should they be. And so should both be treasured, as long as they are distinguished. In a complex and confusing world, the perfect clarity of sports provides a focus for legitimate, utterly unambiguous support or disdain. The Dodgers are evil, the Yankees good. They really are, and have been for as long as anyone in my family can remember. *Stephen Jay Gould* (1941-2002)

- As a word, ecology has been so debased by recent political usage that many people employ it to identify anything good that happens far from cities and without human interference. *Stephen Jay Gould* (1941-2002)
- As an eminent pioneer in the realm of high frequency currents... I congratulate you (Nikola Tesla) on the great successes of your life's work. *Albert Einstein* (1879-1955)
- As far as the laws of mathematics refer to reality, they are not certain; as far as they are certain, they do not refer to reality. *Albert Einstein* (1879-1955)
- As long as I can conceive something better than myself I cannot be easy unless I am striving to bring it into existence or clearing the way for it. *George Bernard Shaw* (1856-1950)
- As man advances in civilisation, and small tribes are united into larger communities, the simplest reason would tell each individual that he ought to extend his social instincts and sympathies to all the members of the same nation, though personally unknown to him. This point being once reached, there is only an artificial barrier to prevent his sympathies extending to the men of all nations and races. *Charles Darwin* (1809-1882)
- As our circle of knowledge expands, so does the circumference of darkness surrounding it. *Albert Einstein* (1879-1955)
- As regards religion, on the other hand, one is generally agreed that it deals with goals and evaluations and, in general, with the emotional foundation of human thinking and acting, as far as these are not predetermined by the inalterable hereditary disposition of the human species. Religion is concerned with man's attitude toward nature at large, with the establishing of ideals for the individual and communal life, and with mutual human relationship. These ideals religion attempts to attain by exerting an educational influence on tradition and through the development and promulgation of certain easily accessible thoughts and narratives (epics and myths) which are apt to influence evaluation and action along the lines of the accepted ideals. *Albert Einstein* (1879-1955)
- As the arteries grow hard, the heart grows soft. *Henry Louis Mencken* (1880-1956)
- As the issues are greater than men ever sought to realize before, the recriminations will be fiercer and pride more desperately hurt. It may help to recall that many recognized before the bomb ever fell that the time had already come when we must learn to live in One World. *Albert Einstein* (1879-1955)
- As we discern a fine line between crank and genius, so also (and unfortunately) we must acknowledge an equally graded trajectory from crank to demagogue. When people learn no tools of judgment and merely follow their hopes, the seeds of political manipulation are sown. *Stephen Jay Gould* (1941-2002)
- Assassination is the extreme form of censorship. *George Bernard Shaw* (1856-1950)
- At some future period, not very distant as measured by centuries, the civilised races of man will almost certainly exterminate, and replace the savage races throughout the world. *Charles Darwin* (1809-1882)
- Bacteria represent the world's greatest success story. They are today and have always been the modal organisms on earth; they cannot be nuked to oblivion and will outlive us all. This time is their time, not the "age of mammals" as our textbooks chauvinistically proclaim. But their price for such success is permanent relegation to a microworld, and they cannot know the joy and pain of consciousness. We live in a universe of trade-offs; complexity and persistence do not work well as partners. *Stephen Jay Gould* (1941-2002)
- Base and crafty cowards are like the arrow that flieth in the dark. *Sir Francis Bacon* (1561-1626)
- Be careful about reading health books. You may die of a misprint. *Mark Twain* (1835-1910)
- Bear in mind that those who are finer and nobler are always alone - and necessarily so - and that because of this they can enjoy the purity of their own atmosphere. *Albert Einstein* (1879-1955)
- Before a complex of sensations becomes a recollection placeable in time, it has ceased to be actual. We must lose our awareness of its infinite complexity, or it is still actual... It is only after a

memory has lost all life that it can be classed in time, just as only dissected flowers find their way into the herbarium of a botanist. *Jules Henri Poincaré* (1854-1912)

Before God we are all equally wise - and equally foolish. *Albert Einstein* (1879-1955)

Before Kuhn, most scientists followed the place-a-stone-in-the-bright-temple-of-knowledge tradition, and would have told you that they hoped, above all, to lay many of the bricks, perhaps even the keystone, of truth's temple. Now most scientists of vision hope to foment revolution.

We are, therefore, awash in revolutions, most self-proclaimed. *Stephen Jay Gould* (1941-2002)

Besides a mathematical inclination, an exceptionally good mastery of one's native tongue is the most vital asset of a competent programmer. *Edsger W. Dijkstra* (1930–2002)

Biological evolution is a system of constant divergence without subsequent joining of branches. Lineages, once distinct, are separate forever. In human history, transmission across lineages is, perhaps, the major source of cultural change. Europeans learned about corn and potatoes from Native Americans and gave them smallpox in return. *Stephen Jay Gould* (1941-2002)

Both social and biosocial factors are necessary to interpret crosscultural studies, with the general proviso that one's research interest determines which elements, in what combinations, are significant for the provision of understanding. *Gilbert Herdt* (1949- )

Bowing to the reality of harried lives, Rudwick recognizes that not everyone will read every word of the meaty second section; he even explicitly gives us permission to skip if we get “bogged down in the narrative.” Readers absolutely must not do such a thing; it should be illegal. The publisher should lock up the last 60 pages, and deny access to anyone who doesn't pass a multiple-choice exam inserted into the book between parts two and three. *Stephen Jay Gould* (1941-2002)

But, as we consider the totality of similarly broad and fundamental aspects of life, we cannot defend division by two as a natural principle of objective order. Indeed, the “stuff” of the universe often strikes our senses as complex and shaded continua, admittedly with faster and slower moments, and bigger and smaller steps, along the way. Nature does not dictate dualities, trinities, quarterings, or any “objective” basis for human taxonomies; most of our chosen schemes, and our designated numbers of categories, record human choices from a cornucopia of possibilities offered by natural variation from place to place, and permitted by the flexibility of our mental capacities. How many seasons (if we wish to divide by seasons at all) does a year contain? How many stages shall we recognize in a human life? *Stephen Jay Gould* (1941-2002)

But by far the greatest hindrance and aberration of the human understanding proceeds from the dullness, incompetency, and deceptions of the senses; in that things which strike the sense outweigh things which do not immediately strike it, though they be more important. Hence it is that speculation commonly ceases where sight ceases; insomuch that of things invisible there is little or no observation. *Sir Francis Bacon* (1561-1626)

But by far the greatest obstacle to the progress of science and to the undertaking of new tasks and provinces therein is found in this - that men despair and think things impossible. *Sir Francis Bacon* (1561-1626)

But here I stop - short of any deterministic speculation that attributes specific behaviors to the possession of specific altruist or opportunist genes. Our genetic makeup permits a wide range of behaviors - from Ebenezer Scrooge before to Ebenezer Scrooge after. I do not believe that the miser hoards through opportunist genes or that the philanthropist gives because nature endowed him with more than the normal complement of altruist genes. Upbringing, culture, class, status, and all the intangibles that we call “free will,” determine how we restrict our behaviors from the wide spectrum - extreme altruism to extreme selfishness - that our genes permit. *Stephen Jay Gould* (1941-2002)

But how is one to determine what is pleasing to God?... Whatever is unpleasant to man is pleasant to God. The test is the natural instinct of man. If there arises within one's dark recesses a hot desire to do this or that, then it is the paramount duty of a Christian to avoid doing this or that.

And if, on the contrary, one cherishes an abhorrence of the business, then one must tackle it forthwith, all the time shouting 'Hallelujah!' A simple enough religion, surely - simple, satisfying and idiotic. *Henry Louis Mencken* (1880-1956)

But men must know that in this theater of man's life it is reserved only for God and angels to be lookers on. *Sir Francis Bacon* (1561-1626)

But the best demonstration by far is experience, if it go not beyond the actual experiment. *Sir Francis Bacon* (1561-1626)

By an application of the theory of relativity to the taste of readers, today in Germany I am called a German man of science, and in England I am represented as a Swiss Jew. If I come to be represented as a *bête noire*, the descriptions will be reversed, and I shall become a Swiss Jew for the Germans and a German man of science for the English! *Albert Einstein* (1879-1955)

Can science ever be immune from experiments conceived out of prejudices and stereotypes, conscious or not? (Which is not to suggest that it cannot in discrete areas identify and locate verifiable phenomena in nature.) I await the study that says lesbians have a region of the hypothalamus that resembles straight men and I would not be surprised if, at this very moment, some scientist somewhere is studying brains of deceased Asians to see if they have an enlarged "math region" of the brain. *Kay Diaz*

Certainly, it is heaven upon earth, to have a man's mind move in charity, rest in providence, and turn upon the poles of truth. *Sir Francis Bacon* (1561-1626)

Chance favors only the prepared mind. *Louis Pasteur* (1822-1895)

Clarity about the aims and problems of socialism is of greatest significance in our age of transition. Since, under present circumstances, free and unhindered discussion of these problems has come under a powerful taboo, I consider the foundation of this magazine to be an important public service. *Albert Einstein* (1879-1955)

Coincidence is God's way of remaining anonymous. *Albert Einstein* (1879-1955)

Common to all these types is the anthropomorphic character of their conception of God. In general, only individuals of exceptional endowments, and exceptionally high-minded communities, rise to any considerable extent above this level. But there is a third stage of religious experience which belongs to all of them, even though it is rarely found in a pure form: I shall call it cosmic religious feeling. It is very difficult to elucidate this feeling to anyone who is entirely without it, especially as there is no anthropomorphic conception of God corresponding to it. *Albert Einstein* (1879-1955)

Complex organisms cannot be construed as the sum of their genes, nor do genes alone build particular items of anatomy or behavior by themselves. Most genes influence several aspects of anatomy and behavior - as they operate through complex interactions with other genes and their products, and with environmental factors both within and outside the developing organism. We fall into a deep error, not just a harmful oversimplification, when we speak of genes "for" particular items of anatomy or behavior. *Stephen Jay Gould* (1941-2002)

Compound interest is the most powerful force in the universe. *Albert Einstein* (1879-1955)

Computer Science is no more about computers than astronomy is about telescopes. *Edsger W. Dijkstra* (1930-2002)

Computers are incredibly fast, accurate and stupid. Human beings are incredibly slow, inaccurate and brilliant. Together they are powerful beyond imagination. *Albert Einstein* (1879-1955)

Concepts that have proven useful in ordering things easily achieve such authority over us that we forget their earthly origins and accept them as unalterable givens. *Albert Einstein* (1879-1955)

Consciousness is never experienced in the plural, only in the singular. Not only has none of us ever experienced more than one consciousness, but there is also no trace of circumstantial evidence of this ever happening anywhere in the world. If I say that there cannot be more than one consciousness in the same mind, this seems a blunt tautology - we are quite unable to imagine the contrary. *Erwin Schrödinger* (1887-1961)



Contingency is a thing unto itself, not the titration of determinism by randomness. *Stephen Jay Gould* (1941-2002)

Contingency is rich and fascinating; it embodies an exquisite tension between the power of individuals to modify history and the intelligible limits set by laws of nature. The details of individual and species's lives are not mere frills, without power to shape the large-scale course of events, but particulars that can alter entire futures, profoundly and forever. *Stephen Jay Gould* (1941-2002)

Creationists don't want equal time, ... they want all the time there is. *Isaac Asimov* (1920-1992)

Creationists make it sound as though a 'theory' is something you dreamt up after being drunk all night. *Isaac Asimov* (1920-1992)

Creative work, in geology and anywhere else, is interaction and synthesis: half-baked ideas from a barroom, rocks in the field, chains of thought from lonely walks, numbers squeezed from rocks in a laboratory, numbers from a calculator riveted to a desk, fancy equipment usually malfunctioning on expensive ships, cheap equipment in the human cranium, arguments before a roadcut. *Stephen Jay Gould* (1941-2002)

Darwin grasped the philosophical bleakness with his characteristic courage. He argued that hope and morality cannot, and should not, be passively read in the construction of nature. Aesthetic and moral truths, as human concepts, must be shaped in human terms, not "discovered" in nature. We must formulate these answers for ourselves and then approach nature as a partner who can answer other kinds of questions for us - questions about the factual state of the universe, not about the meaning of human life. If we grant nature the independence of her own domain - her answers unframed in human terms - then we can grasp her exquisite beauty in a free and humble way. For then we become liberated to approach nature without the burden of an inappropriate and impossible quest for moral messages to assuage our hopes and fears. We can pay our proper respect to nature's independence and read her own ways as beauty or inspiration in our different terms. *Stephen Jay Gould* (1941-2002)

Debate is an art form. It is about the winning of arguments. It is not about the discovery of truth. There are certain rules and procedures to debate that really have nothing to do with establishing fact - which creationists have mastered. Some of those rules are: never say anything positive about your own position because it can be attacked, but chip away at what appear to be the weaknesses in your opponent's position. They are good at that. I don't think I could beat the creationists at debate. I can tie them. But in courtrooms they are terrible, because in courtrooms you cannot give speeches. In a courtroom you have to answer direct questions about the positive status of your belief. We destroyed them in Arkansas. On the second day of the two-week trial we had our victory party! *Stephen Jay Gould* (1941-2002)

Democracy is a device that insures we shall be governed no better than we deserve. *George Bernard Shaw* (1856-1950)

Democracy is a form of government that substitutes election by the incompetent many for appointment by the corrupt few. *George Bernard Shaw* (1856-1950)

Democracy is also a form of worship. It is the worship of Jackals by Jackasses. *Henry Louis Mencken* (1880-1956)

Democracy is the art and science of running the circus from the monkey cage. *Henry Louis Mencken* (1880-1956)

Democracy is the theory that the common people know what they want and deserve to get it good and hard. *Henry Louis Mencken* (1880-1956)

Democracy: the domination of unreflective and timorous men, moved in vast herds by mob conditions. *Henry Louis Mencken* (1880-1956)

Details are all that matters: God dwells there, and you never get to see Him if you don't struggle to get them right. *Stephen Jay Gould* (1941-2002)

Development of Western Science is based on two great achievements - the invention of the formal logical system (in Euclidean geometry) by the Greek philosophers, and the discovery of the possibility to find out causal relationships by systematic experiment (during the Renaissance). In my opinion, one has not to be astonished that the Chinese sages have not made these steps. The astonishing thing is that these discoveries were made at all. *Albert Einstein* (1879-1955)

Do not worry about your problems in mathematics. I assure you, my problems with mathematics are much greater than yours. *Albert Einstein* (1879-1955)

Do only what only you can do. *Edsger W. Dijkstra* (1930–2002)

Does the harmony the human intelligence thinks it discovers in nature exist outside of this intelligence? No, beyond doubt, a reality completely independent of the mind which conceives it, sees or feels it, is an impossibility. *Jules Henri Poincaré* (1854-1912)

Does there truly exist an insuperable contradiction between religion and science? Can religion be superseded by science? The answers to these questions have, for centuries, given rise to considerable dispute and, indeed, bitter fighting. Yet, in my own mind there can be no doubt that in both cases a dispassionate consideration can only lead to a negative answer. What complicates the solution, however, is the fact that while most people readily agree on what is meant by “science,” they are likely to differ on the meaning of “religion.” *Albert Einstein* (1879-1955)

Each and every loss becomes an instance of ultimate tragedy - something that once was, but shall never be known to us. The hump of the giant deer - as a nonfossilizable item of soft anatomy - should have fallen into the maw of erased history. But our ancestors provided a wondrous rescue, and we should rejoice mightily. Every new item can instruct us; every unexpected object possesses beauty for its own sake; every rescue from history's great shredding machine is - and I don't know how else to say this - a holy act of salvation for a bit of totality. *Stephen Jay Gould* (1941-2002)

Each of the major sciences has contributed an essential ingredient in our long retreat from an initial belief in our own cosmic importance. Astronomy defined our home as a small planet tucked away in one corner of an average galaxy among millions; biology took away our status as paragons created in the image of God; geology gave us the immensity of time and taught us how little of it our own species has occupied. *Stephen Jay Gould* (1941-2002)

Each worldview was a cultural product, but evolution is true and separate creation is not... Worldviews are social constructions, and they channel the search for facts. But facts are found and knowledge progresses, however fitfully. Fact and theory are intertwined, and all great scientists understand the interaction. *Stephen Jay Gould* (1941-2002)

Early in my school career, I turned out to be an incorrigible disciplinary problem. I could understand what the teacher was saying as fast as she could say it, I found time hanging heavy, so I would occasionally talk to my neighbor. That was my great crime, I talked. *Isaac Asimov* (1920-1992)

Education consists mainly in what we have unlearned. *Mark Twain* (1835-1910)

Education is what remains after one has forgotten everything he learned in school. *Albert Einstein* (1879-1955)

Einstein was a giant. His head was in the clouds, but his feet were on the ground. Those of us who are not so tall have to choose! *Richard Phillips Feynman* (1918-1988)

Elegance is not a dispensable luxury but a quality that decides between success and failure. *Edsger W. Dijkstra* (1930–2002)

Enough for me the mystery of the eternity of life, and the inkling of the marvellous structure of reality, together with the single-hearted endeavour to comprehend a portion, be it never so tiny, of the reason that manifests itself in nature. *Albert Einstein* (1879-1955)

Equations are more important to me, because politics is for the present, but an equation is something for eternity. *Albert Einstein* (1879-1955)

Essentially, all models are wrong, but some are useful. *George Edward Pelham Box* (1919- )

Ethical axioms are found and tested not very differently from the axioms of science. Truth is what stands the test of experience. *Albert Einstein* (1879-1955)

Eugene Dubois is no hero in my book, if only because I share the spirit of his unorthodoxies, but disagree so strongly with his version, and regard his supporting arguments as so weakly construed and so willfully blind to opposing evidence (the dogmatist within is always worse than the enemy without). *Stephen Jay Gould* (1941-2002)

Even on the most solemn occasions I got away without wearing socks and hid that lack of civilisation in high boots. *Albert Einstein* (1879-1955)

Even though the realms of religion and science in themselves are clearly marked off from each other, nevertheless there exist between the two strong reciprocal relationships and dependencies. Though religion may be that which determines the goal, it has, nevertheless, learned from science, in the broadest sense, what means will contribute to the attainment of the goals it has set up. But science can only be created by those who are thoroughly imbued with the aspiration toward truth and understanding. This source of feeling, however, springs from the sphere of religion. To this there also belongs the faith in the possibility that the regulations valid for the world of existence are rational, that is, comprehensible to reason. I cannot conceive of a genuine scientist without that profound faith. The situation may be expressed by an image: science without religion is lame, religion without science is blind. *Albert Einstein* (1879-1955)

Every complex problem has a solution that is simple, neat, and wrong. *Henry Louis Mencken* (1880-1956)

Every definition implies an axiom, since it asserts the existence of the object defined. The definition then will not be justified, from the purely logical point of view, until we have "proved" that it involves no contradiction either in its terms or with the truths previously admitted. *Jules Henri Poincaré* (1854-1912)

Every great advance in natural knowledge has involved the absolute rejection of authority. *Thomas Henry Huxley* (1825-1895)

Every truth starts life as a heresy and ends life as an orthodoxy. *Thomas Henry Huxley* (1825-1895)

Everybody firmly believes in it [Normal Law of Errors] because the mathematicians imagine it is a fact of observation, and observers that it is a theory of mathematics. *Jules Henri Poincaré* (1854-1912)

Everyone is aware of the difficult and menacing situation in which human society - shrunk into one community with a common fate - now finds itself, but only a few act accordingly. Most people go on living their every-day life: half frightened, half indifferent, they behold the ghostly tragedy which is being performed on the international stage before the eyes and ears of the world. But on that stage, on which the actors under the floodlights play their ordained parts, our fate of tomorrow, life or death of the nations, is being decided. *Albert Einstein* (1879-1955)

Everything should be made as simple as possible, but not simpler. *Albert Einstein* (1879-1955)

Everything that is really great and inspiring is created by the individual who can labor in freedom. *Albert Einstein* (1879-1955)

Everything that the human race has done and thought is concerned with the satisfaction of deeply felt needs and the assuagement of pain. One has to keep this constantly in mind if one wishes to understand spiritual movements and their development. Feeling and longing are the motive force behind all human endeavor and human creation, in however exalted a guise the latter may present themselves to us. *Albert Einstein* (1879-1955)

Evolution is a theory of organic change, but it does not imply, as many people assume, that ceaseless flux is the irreducible state of nature and that structure is but a temporary incarnation of the moment. Change is more often a rapid transition between stable states than a continuous transformation at slow and steady rates. We live in a world of structure and legitimate distinction. Species are the units of nature's morphology. *Stephen Jay Gould* (1941-2002)

Evolution is an obstacle course not a freeway; the correct analogue for long-term success is a distant punt receiver evading legions of would-be tacklers in an oddly zigzagged path toward a goal, not a horse thundering down the flat. *Stephen Jay Gould* (1941-2002)

Evolution is the conviction that organisms developed their current forms by an extended history of continual transformation, and that ties of genealogy bind all living things into one nexus. Panselctionism is a denial of history, for perfection covers the tracks of time. A perfect wing may have evolved to its current state, but it may have been created just as we find it. We simply cannot tell if perfection be our only evidence. As Darwin himself understood so well, the primary proofs of evolution are oddities and imperfections that must record pathways of historical descent - the panda's thumb and the flamingo's smile of my book titles (chosen to illustrate this paramount principle of history). *Stephen Jay Gould* (1941-2002)

Evolutionists sometimes take as haughty an attitude toward the next level up the conventional ladder of disciplines: the human sciences. They decry the supposed atheoretical particularism of their anthropological colleagues and argue that all would be well if only the students of humanity regarded their subject as yet another animal and therefore yielded explanatory control to evolutionary biologists. *Stephen Jay Gould* (1941-2002)

Facts are stubborn, but statistics are more pliable. *Mark Twain* (1835-1910)

Falling in love is not at all the most stupid thing that people do - but gravitation cannot be held responsible for it. *Albert Einstein* (1879-1955)

False facts are highly injurious to the progress of science, for they often endure long; but false views, if supported by some evidence, do little harm, for every one takes a salutary pleasure in proving their falseness. *Charles Darwin* (1809-1882)

Few are those who see with their own eyes and feel with their own hearts. *Albert Einstein* (1879-1955)

Few intellectual tyrannies can be more recalcitrant than the truths that everybody knows and nearly no one can defend with any decent data (for who needs proof of anything so obvious). And few intellectual activities can be more salutary than attempts to find out whether these rocks of ages might crumble at the slightest tap of an informational hammer. *Stephen Jay Gould* (1941-2002)

Few people are capable of expressing with equanimity opinions which differ from the prejudices of their social environment. Most people are even incapable of forming such opinions. *Albert Einstein* (1879-1955)

Few people think more than two or three times a year. I have made an international reputation for myself by thinking once or twice a week. *George Bernard Shaw* (1856-1950)

For a successful technology, reality must take precedence over public relations, for Nature cannot be fooled. *Richard Phillips Feynman* (1918-1988)

For all knowledge and wonder (which is the seed of knowledge) is an impression of pleasure in itself. *Sir Francis Bacon* (1561-1626)

For every complex problem, there is a solution that is simple, neat, and wrong. *Thomas Henry Huxley* (1825-1895)

For Linnaeus, Homo sapiens was both special and not special... Special and not special have come to mean nonbiological and biological, or nurture and nature. These later polarizations are nonsensical. Humans are animals and everything we do lies within our biological potential... the statement that humans are animals does not imply that our specific patterns of behavior and social arrangements are in any way directly determined by our genes. Potentiality and determination are different concepts. *Stephen Jay Gould* (1941-2002)

For me, the first challenge for computing science is to discover how to maintain order in a finite, but very large, discrete universe that is intricately intertwined. And a second, but not less important challenge is how to mould what you have achieved in solving the first problem, into a teachable discipline: it does not suffice to hone your own intellect (that will join you in your grave), you must teach others how to hone theirs. The more you concentrate on these two

challenges, the clearer you will see that they are only two sides of the same coin: teaching yourself is discovering what is teachable. *Edsger W. Dijkstra* (1930–2002)

For scientific endeavor is a natural whole the parts of which mutually support one another in a way which, to be sure, no one can anticipate. *Albert Einstein* (1879-1955)

For the most part we humans live with the false impression of security and a feeling of being at home in a seemingly trustworthy physical and human environment. But when the expected course of everyday life is interrupted, we are like shipwrecked people on a miserable plank in the open sea, having forgotten where they came from and not knowing whither they are drifting. But once we fully accept this, life becomes easier and there is no longer any disappointment. *Albert Einstein* (1879-1955)

For thousands of years men have striven and suffered and begotten and woman have brought forth in pain. A hundred years ago, perhaps, another man sat on this spot; like you he gazed with awe and yearning in his heart at the dying light on the glaciers. Like you he was begotten of man and born of woman. He felt pain and brief joy as you do. Was he someone else? Was it not you yourself? What is this Self of yours? What was the necessary condition for making the thing conceived this time into you, just you and not someone else? *Erwin Schrödinger* (1887-1961)

For what is thought to be a "system" is after all, just conventional, and I do not see how one is supposed to divide up the world objectively so that one can make statements about parts. *Albert Einstein* (1879-1955)

Former arbiters of taste must have felt (as so many apostles of "traditional values" and other high-minded tags for restriction and conformity do today) that maintaining the social order required a concept of unalloyed heroism. Human beings so designated as role models had to embody all virtues of the paragon - which meant, of course, that they could not be described in their truly human and ineluctably faulted form. *Stephen Jay Gould* (1941-2002)

FORTTRAN, 'the infantile disorder', by now nearly 20 years old, is hopelessly inadequate for whatever computer application you have in mind today: it is now too clumsy, too risky, and too expensive to use. *Edsger W. Dijkstra* (1930–2002)

Fortunately science, like that nature to which it belongs, is neither limited by time nor by space. It belongs to the world, and is of no country and of no age. The more we know, the more we feel our ignorance; the more we feel how much remains unknown; and in philosophy, the sentiment of the Macedonian hero can never apply, - there are always new worlds to conquer. *Sir Humphry Davy* (1778-1829)

From my close observation of writers... they fall into two groups: 1) those who bleed copiously and visibly at any bad review, and 2) those who bleed copiously and secretly at any bad review. *Isaac Asimov* (1920-1992)

Further, it will not be amiss to distinguish the three kinds and, as it were, grades of ambition in mankind. The first is of those who desire to extend their own power in their native country, a vulgar and degenerate kind. The second is of those who labor to extend the power and dominion of their country among men. This certainly has more dignity, though not less covetousness. But if a man endeavor to establish and extend the power and dominion of the human race itself over the universe, his ambition (if ambition it can be called) is without doubt both a more wholesome and a more noble thing than the other two. Now the empire of man over things depends wholly on the arts and sciences. For we cannot command nature except by obeying her. *Sir Francis Bacon* (1561-1626)

Generations to come, it may be, will scarcely believe that such a one as this ever in flesh and blood walked upon this earth. *Albert Einstein* (1879-1955)

Genes make enzymes, and enzymes control the rates of chemical processes. Genes do not make "novelty seeking" or any other complex and overt behavior. Predisposition via a long chain of complex chemical reactions, mediated through a more complex series of life's circumstances, does not equal identification or even causation. *Stephen Jay Gould* (1941-2002)

Get your facts first, and then you can distort them as much as you please. *Mark Twain* (1835-1910)

Give me the place to stand, and I shall move the earth. *Archimedes* (c. 287 BC – c. 212 BC)

God bless all the precious little examples and all their cascading implications; without these gems, these tiny acorns bearing the blueprints of oak trees, essayists would be out of business. *Stephen Jay Gould* (1941-2002)

God does not care about our mathematical difficulties. He integrates empirically. *Albert Einstein* (1879-1955)

God does not play dice. *Albert Einstein* (1879-1955)

God does not play dice with the universe. *Albert Einstein* (1879-1955)

Good scholars struggle to understand the world in an integral way (pedants bite off tiny bits and worry them to death). These visions of reality... demand our respect, for they are an intellectual's only birthright. They are often entirely wrong and always flawed in serious ways, but they must be understood honorably and not subjected to mayhem by the excision of patches. *Stephen Jay Gould* (1941-2002)

Gravitation cannot be held responsible for people falling in love. *Albert Einstein* (1879-1955)

Gravitation is not responsible for people falling in love. *Albert Einstein* (1879-1955)

Great spirits have always encountered violent opposition from mediocre minds. The mediocre mind is incapable of understanding the man who refuses to bow blindly to conventional prejudices and chooses instead to express his opinions courageously and honestly. *Albert Einstein* (1879-1955)

Great spirits have always found violent opposition from mediocrities. The latter cannot understand it when a man does not thoughtlessly submit to hereditary prejudices but honestly and courageously uses his intelligence and fulfills the duty to express the results of his thoughts in clear form. *Albert Einstein* (1879-1955)

Great theories are expansive; failures mire us in dogmatism and tunnel vision. *Stephen Jay Gould* (1941-2002)

Great thinkers build their edifices with subtle consistency. We do our intellectual forebears an enormous disservice when we dismember their visions and scan their systems in order to extract a few disembodied “gems” - thoughts or claims still accepted as true. These disarticulated pieces then become the entire legacy of our ancestors, and we lose the beauty and coherence of older systems that might enlighten us by their unfamiliarity - and their consequent challenge’ in our fallible (and complacent) modern world. *Stephen Jay Gould* (1941-2002)

Guessing right for the wrong reason does not merit scientific immortality. *Stephen Jay Gould* (1941-2002)

Half the time of all medical men is wasted keeping life in human wrecks who have no more intelligible reason for hanging on than a cow has for giving milk. *Henry Louis Mencken* (1880-1956)

He who can, does. He who cannot, teaches. *George Bernard Shaw* (1856-1950)

He who can no longer pause to wonder and stand rapt in awe, is as good as dead; his eyes are closed. *Albert Einstein* (1879-1955)

He who joyfully marches to music in rank and file has already earned my contempt. He has been given a large brain by mistake, since for him the spinal cord would fully suffice. This disgrace to civilisation should be done away with at once. Heroism at command, senseless brutality, deplorable love-of-country stance, how violently I hate all this, how despicable and ignoble war is; I would rather be torn to shreds than be part of so base an action! It is my conviction that killing under the cloak of war is nothing but an act of murder. *Albert Einstein* (1879-1955)

He who teaches that not reason but love should rule opens the way for those who rule by hate. *Karl Raimund Popper* (1902-1994)

Hegel was right when he said that we learn from history that man can never learn anything from history. *George Bernard Shaw* (1856-1950)

- Historical science is not worse, more restricted, or less capable of achieving firm conclusions because experiment, prediction, and subsumption under invariant laws of nature do not represent its usual working methods. The sciences of history use a different mode of explanation, rooted in the comparative and observational richness in our data. We cannot see a past event directly, but science is usually based on inference, not unvarnished observation (you don't see electrons, gravity, or black holes either). *Stephen Jay Gould* (1941-2002)
- Hope is a good breakfast, but it is a bad supper. *Sir Francis Bacon* (1561-1626)
- How can cosmic religious feeling be communicated from one person to another, if it can give rise to no definite notion of a God and no theology? In my view, it is the most important function of art and science to awaken this feeling and keep it alive in those who are receptive to it. *Albert Einstein* (1879-1955)
- How can it be that mathematics, being after all a product of human thought which is independent of experience, is so admirably appropriate to the objects of reality? Is human reason, then, without experience, merely by taking thought, able to fathom the properties of real things? *Albert Einstein* (1879-1955)
- How do we convince people that in programming simplicity and clarity - in short: what mathematicians call "elegance" - are not a dispensable luxury, but a crucial matter that decides between success and failure? *Edsger W. Dijkstra* (1930-2002)
- How do we tell truths that might hurt? *Edsger W. Dijkstra* (1930-2002)
- How does it happen that a properly endowed natural scientist comes to concern himself with epistemology? *Albert Einstein* (1879-1955)
- How much do I love that noble man / More than I could tell with words / I fear though he'll remain alone / With a holy halo of his own. *Albert Einstein* (1879-1955)
- How often people speak of art and science as though they were two entirely different things, with no interconnection. An artist is emotional, they think, and uses only his intuition; he sees all at once and has no need of reason. A scientist is cold, they think, and uses only his reason; he argues carefully step by step, and needs no imagination. That is all wrong. The true artist is quite rational as well as imaginative and knows what he is doing; if he does not, his art suffers. The true scientist is quite imaginative as well as rational, and sometimes leaps to solutions where reason can follow only slowly; if he does not, his science suffers. *Isaac Asimov* (1920-1992)
- How strange is the lot of us mortals! Each of us is here for a brief sojourn; for what purpose he knows not, though he sometimes thinks he senses it. But without deeper reflection one knows from daily life that one exists for other people - first of all for those upon whose smiles and well-being our own happiness is wholly dependent, and then for the many, unknown to us, to whose destinies we are bound by the ties of sympathy. A hundred times every day I remind myself that my inner and outer life are based on the labors of other men, living and dead, and that I must exert myself in order to give in the same measure as I have received and am still receiving. *Albert Einstein* (1879-1955)
- How would we express in terms of the statistical theory the marvelous faculty of a living organism, by which it delays the decay into thermodynamical equilibrium (death)?... the device by which an organism maintains itself stationary at a fairly high level of orderliness... really consists in continually sucking orderliness from its environment. *Erwin Schrödinger* (1887-1961)
- Human knowledge and human power meet in one; for where the cause is not known the effect cannot be produced. Nature to be commanded must be obeyed; and that which in contemplation is as the cause is in operation as the rule. *Sir Francis Bacon* (1561-1626)
- Hyper-selectionism has been with us for a long time in various guises; for it represents the late nineteenth century's scientific version of the myth of natural harmony - all is for the best in the best of all possible worlds (all structures well designed for a definite purpose in this case). It is, indeed, the vision of foolish Dr. Pangloss, so vividly satirized by Voltaire in *Candide* - the

world is not necessarily good, but it is the best we could possibly have. *Stephen Jay Gould* (1941-2002)

I agree with your remark about loving your enemy as far as actions are concerned. But for me the cognitive basis is the trust in an unrestricted causality. 'I cannot hate him, because he must do what he does.' That means for me more Spinoza than the prophets. *Albert Einstein* (1879-1955)

I am a Christian which means that I believe in the deity of Christ, like Tycho de Brahe, Copernicus, Descartes, Newton, Leibnitz, Pascal... like all great astronomers mathematicians of the past. *Augustin Louis Cauchy* (1789-1857)

I am absolutely convinced that no wealth in the world can help humanity forward, even in the hands of the most devoted worker. The example of great and pure individuals is the only thing that can lead us to noble thoughts and deeds. Money only appeals to selfishness and irresistibly invites abuse. Can anyone imagine Moses, Jesus or Ghandi armed with the moneybags of Carnegie? *Albert Einstein* (1879-1955)

I am an adherent of the ideal of democracy, although I well know the weaknesses of the democratic form of government. Social equality and economic protection of the individual appeared to me always as the important communal aims of the state. *Albert Einstein* (1879-1955)

I am an atheist, out and out. It took me a long time to say it. I've been an atheist for years and years, but somehow I felt it was intellectually unrespectable to say one was an atheist, because it assumed knowledge that one didn't have. Somehow, it was better to say one was a humanist or an agnostic. I finally decided that I'm a creature of emotion as well as of reason. Emotionally, I am an atheist. I don't have the evidence to prove that God doesn't exist, but I so strongly suspect he doesn't that I don't want to waste my time. *Isaac Asimov* (1920-1992)

I am born into an environment - I know not whence I came nor whither I go nor who I am. This is my situation as yours, every single one of you. The fact that everyone always was in this same situation, and always will be, tells me nothing. Our burning question as to the whence and whither - all we can ourselves observe about it is the present environment. That is why we are eager to find out about it as much as we can. That is science, learning, knowledge; it is the true source of every spiritual endeavour of man. We try to find out as much as we can about the spatial and temporal surroundings of the place in which we find ourselves put by birth. *Erwin Schrödinger* (1887-1961)

I am by heritage a Jew, by citizenship a Swiss, and by makeup a human being, and only a human being, without any special attachment to any state or national entity whatsoever. *Albert Einstein* (1879-1955)

I am convinced there is only one way to eliminate these grave evils, namely through the establishment of a socialist economy, accompanied by an educational system which would be oriented toward social goals. *Albert Einstein* (1879-1955)

I am enough of an artist to draw freely upon my imagination. Imagination is more important than knowledge. Knowledge is limited. Imagination encircles the world. *Albert Einstein* (1879-1955)

I am glad that the life of pandas is so dull by human standards, for our efforts at conservation have little moral value if we preserve creatures only as human ornaments; I shall be impressed when we show solicitude for warty toads and slithering worms. *Stephen Jay Gould* (1941-2002)

I am not a speed reader. I am a speed understander. *Isaac Asimov* (1920-1992)

I am not... asserting that humans are either genial or aggressive by inborn biological necessity. Obviously, both kindness and violence lie within the bounds of our nature because we perpetrate both, in spades. I only advance a structural claim that social stability rules nearly all the time and must be based on an overwhelmingly predominant (but tragically ignored) frequency of genial acts, and that geniality is therefore our usual and preferred response nearly all the time... The center of human nature is rooted in ten thousand ordinary acts of kindness that define our days. *Stephen Jay Gould* (1941-2002)



- I am not insensible to natural beauty, but my emotional joys center on the improbable yet sometimes wondrous works of that tiny and accidental evolutionary twig called *Homo sapiens*. And I find, among these works, nothing more noble than the history of our struggle to understand nature—a majestic entity of such vast spatial and temporal scope that she cannot care much for a little mammalian afterthought with a curious evolutionary invention, even if that invention has, for the first time in some four billion years of life on earth, produced recursion as a creature reflects back upon its own production and evolution. Thus, I love nature primarily for the puzzles and intellectual delights that she offers to the first organ capable of such curious contemplation. *Stephen Jay Gould* (1941-2002)
- I am not one of those who in expressing opinions confine themselves to facts. *Mark Twain* (1835-1910)
- I am not only a pacifist but a militant pacifist. I am willing to fight for peace. Nothing will end war unless the people themselves refuse to go to war. *Albert Einstein* (1879-1955)
- I am not unmindful of the journalist's quip that yesterday's paper wraps today's garbage. I am also not unmindful of the outrages visited upon our forests to publish redundant and incoherent collections of essays; for, like Dr. Seuss' *Lorax*, I like to think that I speak for the trees. Beyond vanity, my only excuses for a collection of these essays lie in the observation that many people like (and as many people despise) them, and that they seem to cohere about a common theme - Darwin's evolutionary perspective as an antidote to our cosmic arrogance. *Stephen Jay Gould* (1941-2002)
- I am opposed to looking upon logic as a kind of game. One might think that it is a matter of choice or convention which logic one adopts. I disagree with this view. *Karl Raimund Popper* (1902-1994)
- I am particularly fond of (Emmanuel Mendes da Costa's) *Natural History of Fossils* because treatise, more than any other work written in English, records a short episode expressing one of the grand false starts in the history of natural science - and nothing can be quite so informative and instructive as a juicy mistake. *Stephen Jay Gould* (1941-2002)
- I am quite aware that we have just now lightheartedly expelled in imagination many excellent men who are largely, perhaps chiefly, responsible for the buildings of the temple of science; and in many cases our angel would find it a pretty ticklish job to decide. But of one thing I feel sure: if the types we have just expelled were the only types there were, the temple would never have come to be, any more than a forest can grow which consists of nothing but creepers. For these people any sphere of human activity will do, if it comes to a point; whether they become engineers, officers, tradesmen, or scientists depends on circumstances. *Albert Einstein* (1879-1955)
- I am satisfied with the mystery of life's eternity and with a knowledge, a sense, of the marvelous structure of existence - as well as the humble attempt to understand even a tiny portion of the Reason that manifests itself in nature. *Albert Einstein* (1879-1955)
- I am truly a 'lone traveler' and have never belonged to my country, my home, my friends, or even my immediate family, with my whole heart; in the face of all these ties, I have never lost a sense of distance and a need for solitude. *Albert Einstein* (1879-1955)
- I am very astonished that the scientific picture of the real world around me is deficient. It gives a lot of factual information, puts all our experience in a magnificently consistent order, but it is ghastly silent about all and sundry that is really near to our heart, that really matters to us. It cannot tell us a word about red and blue, bitter and sweet, physical pain and physical delight; it knows nothing of beautiful and ugly, good or bad, God and eternity. Science sometimes pretends to answer questions in these domains, but the answers are very often so silly that we are not inclined to take them seriously. *Erwin Schrödinger* (1887-1961)
- I am willing to believe that my unobtainable sixty seconds within a sponge or a flatworm might not reveal any mental acuity that I would care to call consciousness. But I am also confident... that

vultures and sloths, as close evolutionary relatives with the same basic set of organs, lie on our side of any meaningful (and necessarily fuzzy) border - and that we are therefore not mistaken when we look them in the eye and see a glimmer of emotional and conceptual affinity. *Stephen Jay Gould* (1941-2002)

I believe in evidence. I believe in observation, measurement, and reasoning, confirmed by independent observers. I'll believe anything, no matter how wild and ridiculous, if there is evidence for it. The wilder and more ridiculous something is, however, the firmer and more solid the evidence will have to be. *Isaac Asimov* (1920-1992)

I believe in only one thing: liberty; but I do not believe in liberty enough to want to force it upon anyone. *Henry Louis Mencken* (1880-1956)

I believe in Spinoza's God, Who reveals Himself in the lawful harmony of the world, not in a God Who concerns Himself with the fate and the doings of mankind. *Albert Einstein* (1879-1955)

I believe no woman could have invented calculus. *Albert Einstein* (1879-1955)

I believe that a scientist looking at nonscientific problems is just as dumb as the next guy. *Richard Phillips Feynman* (1918-1988)

I believe that only scientists can understand the universe. It is not so much that I have confidence in scientists being right, but that I have so much in nonscientists being wrong. *Isaac Asimov* (1920-1992)

I believe that pipe smoking contributes to a somewhat calm and objective judgment in all human affairs. *Albert Einstein* (1879-1955)

I believe... that we can still have a genre of scientific books suitable for and accessible alike to professionals and interested laypeople. The concepts of science, in all their richness and ambiguity, can be presented without any compromise, without any simplification counting as distortion, in language accessible to all intelligent people... I hope that this book can be read with profit both in seminars for graduate students and - if the movie stinks and you forgot your sleeping pills - on the businessman's special to Tokyo. *Stephen Jay Gould* (1941-2002)

I believe there is no philosophical high-road in science, with epistemological signposts. No, we are in a jungle and find our way by trial and error, building our road behind us as we proceed. *Max Born*

I came to America because of the great, great freedom which I heard existed in this country. I made a mistake in selecting America as a land of freedom, a mistake I cannot repair in the balance of my lifetime. *Albert Einstein* (1879-1955)

I can understand your aversion to the use of the term 'religion' to describe an emotional and psychological attitude which shows itself most clearly in Spinoza... I have not found a better expression than 'religious' for the trust in the rational nature of reality that is, at least to a certain extent, accessible to human reason. *Albert Einstein* (1879-1955)

I cannot conceive of a God who rewards and punishes his creatures, or has a will of the type of which we are conscious in ourselves. An individual who should survive his physical death is also beyond my comprehension, nor do I wish it otherwise; such notions are for the fears or absurd egoism of feeble souls. *Albert Einstein* (1879-1955)

I cannot imagine a God who rewards and punishes the objects of his creation, whose purposes are modeled after our own - a God, in short, who is but a reflection of human frailty. Neither can I believe that the individual survives the death of his body, although feeble souls harbor such thoughts through fear or ridiculous egotisms. *Albert Einstein* (1879-1955)

I confess that I have as vast contemplative ends, as I have moderate civil ends: for I have taken all knowledge to be my province. *Sir Francis Bacon* (1561-1626)

I consider it extremely doubtful whether the happiness of the human race has been enhanced by the technical and industrial developments that followed in the wake of rapidly progressing natural science. *Erwin Schrödinger* (1887-1961)

- I consider it important, indeed urgently necessary, for intellectual workers to get together, both to protect their own economic status and, also, generally speaking, to secure their influence in the political field. *Albert Einstein (1879-1955)*
- I contend that the continued racial classification of *Homo sapiens* represents an outmoded approach to the general problem of differentiation within a species. In other words, I reject a racial classification of humans for the same reasons that I prefer not to divide into subspecies the prodigiously variable West Indian land snails that form the subject of my own research. *Stephen Jay Gould (1941-2002)*
- I could burn my fingers that I wrote that first letter to Roosevelt. *Albert Einstein (1879-1955)*
- I could explain the matter easily enough if I chose; but the result would be that the people who misunderstand the plays would misunderstand the explanations ten times more. *George Bernard Shaw (1856-1950)*
- I despair of persuading people to drop the familiar and comforting tactic of dichotomy. Perhaps, instead, we might expand the framework of debates by seeking other dichotomies more appropriate than, or simply different from, the conventional divisions. All dichotomies are simplifications, but the rendition of a conflict along differing axes of several orthogonal dichotomies might provide an amplitude of proper intellectual space without forcing us to forgo our most comforting tool of thought. *Stephen Jay Gould (1941-2002)*
- I didn't arrive at my understanding of the fundamental laws of the universe through my rational mind. *Albert Einstein (1879-1955)*
- I do not believe in freedom of the will. Schopenhauer's words: "Man can do what he wants, but he cannot will what he wills" accompany me in all situations throughout my life and reconcile me with the actions of others even if they are rather painful to me. This awareness of the lack of freedom of will preserves me from taking too seriously myself and my fellow men as acting and deciding individuals and from losing my temper. *Albert Einstein (1879-1955)*
- I do not claim that intelligence, however defined, has no genetic basis - I regard it as trivially true, uninteresting, and unimportant that it does. The expression of any trait represents a complex interaction of heredity and environment... a specific claim purporting to demonstrate a mean genetic deficiency in the intelligence of American blacks rests upon no new facts whatever and can cite no valid data in its support. It is just as likely that blacks have a genetic advantage over whites. And, either way, it doesn't matter a damn. An individual can't be judged by his group mean. *Stephen Jay Gould (1941-2002)*
- I do not fear computers. I fear lack of them. *Isaac Asimov (1920-1992)*
- I do not know with what weapons World War III will be fought, but World War IV will be fought with sticks and stones. *Albert Einstein (1879-1955)*
- I do not see any reason to assume that the heuristic significance of the principle of general relativity is restricted to gravitation and that the rest of physics can be dealt with separately on the basis of special relativity, with the hope that later on the whole may be fitted consistently into a general relativistic scheme. I do not think that such an attitude, although historically understandable, can be objectively justified. The comparative smallness of what we know today as gravitational effects is not a conclusive reason for ignoring the principle of general relativity in theoretical investigations of a fundamental character. In other words, I do not believe that it is justifiable to ask: What would physics look like without gravitation? *Albert Einstein (1879-1955)*
- I do not think that, practically or morally, we can defend a policy of saving every distinctive local population of organisms. I can cite a good rationale for the preservation of species, for each species is a unique and separate natural object that, once lost, can never be reconstituted. But subspecies are distinctive local populations of species with broader geographic range. Subspecies are dynamic, interbreedable, and constantly changing: what then are we saving by declaring them all inviolate? *Stephen Jay Gould (1941-2002)*

- I don't believe in an afterlife, so I don't have to spend my whole life fearing hell, or fearing heaven even more. For whatever the tortures of hell, I think the boredom of heaven would be even worse. *Isaac Asimov* (1920-1992)
- I don't believe in mathematics. *Albert Einstein* (1879-1955)
- I don't pretend to understand the universe - it's much bigger than I am. *Albert Einstein* (1879-1955)
- I feel most deeply that this whole question of Creation is too profound for human intellect. A dog might as well speculate on the mind of Newton! Let each man hope and believe what he can. *Charles Darwin* (1809-1882)
- I gang my own gait and have never belonged to my country, my home, my friends, or even my immediate family, with my whole heart; in the face of all these ties I have never lost an obstinate sense of detachment, of the need for solitude - a feeling which increases with the years. *Albert Einstein* (1879-1955)
- I have a great respect for religion, and the subject has always fascinated me... Much of this fascination lies in the stunning historical paradox that organized religion has fostered, throughout Western history, both the most unspeakable horrors and the most heartrending examples of human goodness in the face of personal danger. (The evil, I believe, lies in an occasional confluence of religion with secular power. The Catholic Church has sponsored its share of horrors, from Inquisitions to liquidations - but only because this institution held great secular power during much of Western history. When my folks held such sway, more briefly and in Old Testament times, we committed similar atrocities with the same rationales.) *Stephen Jay Gould* (1941-2002)
- I have broken the machine (the atom) and touched the ghost of matter. *Ernest Rutherford* (1871-1937)
- I have found it! (Eureka!) *Archimedes* (c. 287 BC – c. 212 BC)
- I have found no better expression than "religious" for confidence in the rational nature of reality, insofar as it is accessible to human reason. Whenever this feeling is absent, science degenerates into uninspired empiricism. *Albert Einstein* (1879-1955)
- I have long recognized the theory and aesthetic of such comprehensive display: show everything and incite wonder by sheer variety. But I had never realized how powerfully the decor of a cabinet museum can promote this goal until I saw the Dublin [Natural History Museum] fixtures redone right... The exuberance is all of one piece - organic and architectural. I write this essay to offer my warmest congratulations to the Dublin Museum for choosing preservation - a decision not only scientifically right, but also ethically sound and decidedly courageous. The avant-garde is not an exclusive locus of courage; a principled stand within a reconstituted rear unit may call down just as much ridicule and demand equal fortitude. Crowds do not always rush off in admirable or defensible directions. *Stephen Jay Gould* (1941-2002)
- I have never let my schooling interfere with my education. *Mark Twain* (1835-1910)
- I have never looked upon ease and happiness as ends in themselves - this critical basis I call the ideal of a pigsty. The ideals that have lighted my way, and time after time have given me new courage to face life cheerfully, have been Kindness, Beauty, and Truth. Without the sense of kinship with men of like mind, without the occupation with the objective world, the eternally unattainable in the field of art and scientific endeavors, life would have seemed empty to me. The trite objects of human efforts - possessions, outward success, luxury - have always seemed to me contemptible. *Albert Einstein* (1879-1955)
- I have no need of that hypothesis. *Pierre-Simon Laplace* (1749–1827)
- I have no special talents. I am only passionately curious. *Albert Einstein* (1879-1955)
- I have now reached the point where I may indicate briefly what to me constitutes the essence of the crisis of our time. It concerns the relationship of the individual to society. The individual has become more conscious than ever of his dependence upon society. But he does not experience this dependence as a positive asset, as an organic tie, as a protective force, but rather as a threat

to his natural rights, or even to his economic existence. Moreover, his position in society is such that the egotistical drives of his make-up are constantly being accentuated, while his social drives, which are by nature weaker, progressively deteriorate. All human beings, whatever their position in society, are suffering from this process of deterioration. Unknowingly prisoners of their own egotism, they feel insecure, lonely, and deprived of the naive, simple, and unsophisticated enjoyment of life. Man can find meaning in life, short and perilous as it is, only through devoting himself to society. *Albert Einstein* (1879-1955)

I have often been amused by our vulgar tendency to take complex issues, with solutions at neither extreme of a continuum of possibilities, and break them into dichotomies, assigning one group to one pole and the other to an opposite end, with no acknowledgment of subtleties and intermediate positions - and nearly always with moral opprobrium attached to opponents. *Stephen Jay Gould* (1941-2002)

I like to summarize what I regard as the pedestal-smashing messages of Darwin's revolution in the following statement, which might be chanted several times a day, like a Hare Krishna mantra, to encourage penetration into the soul: Humans are not the end result of predictable evolutionary progress, but rather a fortuitous cosmic afterthought, a tiny little twig on the enormously arborescent bush of life, which, if replanted from seed, would almost surely not grow this twig again, or perhaps any twig with any property that we would care to call consciousness. *Stephen Jay Gould* (1941-2002)

I live in that solitude which is painful in youth, but delicious in the years of maturity. *Albert Einstein* (1879-1955)

I love fools' experiments. I am always making them. *Charles Darwin* (1809-1882)

I love to read the dedications of old books written in monarchies - for they invariably honor some (usually insignificant) knight or duke with fulsome words of sycophantic insincerity, praising him as the light of the universe (in hopes, no doubt, for a few ducats to support future work); this old practice makes me feel like such an honest and upright man, by comparison, when I put a positive spin, perhaps ever so slightly exaggerated, on a grant proposal. *Stephen Jay Gould* (1941-2002)

I love to travel, but hate to arrive. *Albert Einstein* (1879-1955)

I mean, if 10 years from now, when you are doing something quick and dirty, you suddenly visualize that I am looking over your shoulders and say to yourself "Dijkstra would not have liked this", well, that would be enough immortality for me. *Edsger W. Dijkstra* (1930-2002)

I never think of the future. It comes soon enough. *Albert Einstein* (1879-1955)

I never worry about the future. It comes soon enough. *Albert Einstein* (1879-1955)

I picture several reviewers of my own books as passing a long future lodged between Brutus and Judas in the jaws of Satan. *Stephen Jay Gould* (1941-2002)

I prefer rationalism to atheism. The question of God and other objects-of-faith are outside reason and play no part in rationalism, thus you don't have to waste your time in either attacking or defending. *Isaac Asimov* (1920-1992)

I realized that my prior projects were just finger warm-ups. Now I have to tackle complexity itself. But it took long, before I had assembled the courage to do so. *Edsger W. Dijkstra* (1930-2002)

I relish the fact that we New Yorkers talk funny, and that art deco skyscrapers symbolize our city... But we must set boundaries to this love of variety. I accept the need, even the blessings, of standardization in practical matters: we require a worldwide telephone dialing system and a network of national highways... We need domains of standardization, and realms of regionalism, each in its appropriate place, and linked in mutual respect and recognition. I accept and even want McDonalds at the highway interchange - but not in my little neighborhood of ethnic restaurants, and not next to the Corn Palace in Mitchell, South Dakota. *Stephen Jay Gould* (1941-2002)

- I respect Kirkpatrick both for his sponges and for his numinous nummulosphere. It is easy to dismiss a crazy theory with laughter that debars any attempt to understand a man's motivation - and the nummulosphere is a crazy theory. I find that few men of imagination are not worth my attention. Their ideas may be wrong, even foolish, but their methods often repay a close study... The different drummer often beats a fruitful tempo. *Stephen Jay Gould* (1941-2002)
- I see no good reasons why the views given in this volume should shock the religious sensibilities of anyone. *Charles Darwin* (1809-1882)
- I stand before you as somebody who is both physicist and a priest, and I want to hold together my scientific and my religious insights and experiences. I want to hold them together, as far as I am able, without dishonesty and without compartmentalism. I don't want to be a priest on Sunday and a physicist on Monday; I want to be both on both days. *John Polkinghorne* (1930- )
- I strongly reject any conceptual scheme that places our options on a line, and holds that the only alternative to a pair of extreme positions lies somewhere between them. More fruitful perspectives often require that we step off the line to a site outside the dichotomy. *Stephen Jay Gould* (1941-2002)
- I think and think for months and years. Ninety-nine times, the conclusion is false. The hundredth time I am right. *Albert Einstein* (1879-1955)
- I think that a particle must have a separate reality independent of the measurements. That is an electron has spin, location and so forth even when it is not being measured. I like to think that the moon is there even if I am not looking at it. *Albert Einstein* (1879-1955)
- I think that only daring speculation can lead us further and not accumulation of facts. *Albert Einstein* (1879-1955)
- I took thought, and invented what I conceived to be the appropriate title of 'agnostic'. *Thomas Henry Huxley* (1825-1895)
- I type and think at 90 words a minute. *Isaac Asimov* (1920-1992)
- I view the major features of my own odyssey as a set of mostly fortunate contingencies. I was not destined by inherited mentality or family tradition to become a paleontologist. I can locate no tradition for scientific or intellectual careers anywhere on either side of my eastern European Jewish background... I view my serious and lifelong commitment to baseball in entirely the same manner: purely as a contingent circumstance of numerous, albeit not entirely capricious, accidents. *Stephen Jay Gould* (1941-2002)
- I want to argue that the “sudden” appearance of species in the fossil record and our failure to note subsequent evolutionary change within them is the proper prediction of evolutionary theory as we understand it... Evolutionary “sequences” are not rungs on a ladder, but our retrospective reconstruction of a circuitous path running like a labyrinth, branch to branch, from the base of the bush to a lineage now surviving at its top. *Stephen Jay Gould* (1941-2002)
- I want to know God's thoughts; the rest are details. *Albert Einstein* (1879-1955)
- I want to know how God created this world. I am not interested in this or that phenomenon, in the spectrum of this or that element. I want to know His thoughts; the rest are details. *Albert Einstein* (1879-1955)
- I was born not knowing and have only had a little time to change that here and there. *Richard Phillips Feynman* (1918-1988)
- I went to the movies to see Independence Day, the outer-space summer blockbuster of 1996. (Even the most committed intellectual can't survive on an unalloyed diet of Jane Austen remakes.) *Stephen Jay Gould* (1941-2002)
- I wish they don't forget to keep those treasures pure which they have in excellence over the west: their artistic building of life, the simplicity and modesty in personal need, and the pureness and calmness of Japanese soul. *Albert Einstein* (1879-1955)

- I would trade all the advantages of humanity to be a fly on the wall when Franklin and Jefferson discussed liberty, Lenin and Trotsky revolution, Newton and Halley the shape of the universe, or when Darwin entertained Huxley and Lyell at Down. *Stephen Jay Gould* (1941-2002)
- I write for the same reason I breathe - because if I didn't, I would die. *Isaac Asimov* (1920-1992)
- Iconography becomes even more revealing when processes or concepts, rather than objects, must be depicted - for the constraint of a definite "thing" cedes directly to the imagination. How can we draw "evolution" or "social organization," not to mention the more mundane "digestion" or "self-interest," without portraying more of a mental structure than a physical reality? If we wish to trace the history of ideas, iconography becomes a candid camera trained upon the scholar's mind. *Stephen Jay Gould* (1941-2002)
- If A equals success, then the formula is A equals X plus Y plus Z. X is work. Y is play. Z is keep your mouth shut. *Albert Einstein* (1879-1955)
- If A is a success in life, then A equals x plus y plus z. Work is x; y is play; and z is keeping your mouth shut. *Albert Einstein* (1879-1955)
- If a little knowledge is dangerous, where is the man who has so much as to be out of danger? *Thomas Henry Huxley* (1825-1895)
- If a man dies of cancer in fear and despair, then cry for his pain and celebrate his life. The other man, who fought like hell and laughed in the end, but also died, may have had an easier time in his final months, but took his leave with no more humanity. *Stephen Jay Gould* (1941-2002)
- If a man will begin with certainties, he shall end in doubts; but if he will be content to begin with doubts he shall end in certainties. *Sir Francis Bacon* (1561-1626)
- If all economists were laid end to end, they would not reach a conclusion. *George Bernard Shaw* (1856-1950)
- If all the parts of the universe are interchained in a certain measure, any one phenomenon will not be the effect of a single cause, but the resultant of causes infinitely numerous. *Jules Henri Poincaré* (1854-1912)
- If he (a politician) is a smart and enterprising fellow, which he usually is, he quickly discovers there that hoey pleases the boobs a great deal more than sense. Indeed, he finds that sense really disquiets and alarms them - that it makes them, at best, intolerably uncomfortable, just as a tight collar makes them uncomfortable, or a speck of dust in the eye, or a the thought of Hell. The truth, to the overwhelming majority of mankind, is indistinguishable from a headache. *Henry Louis Mencken* (1880-1956)
- If history repeats itself, and the unexpected always happens, how incapable must Man be of learning from experience! *George Bernard Shaw* (1856-1950)
- If I am right, then (religious fundamentalists) will not go to Heaven, because there is no Heaven. If they are right, then they will not go to Heaven, because they are hypocrites. *Isaac Asimov* (1920-1992)
- If I choose to impose individual blame for all past social ills, there will be no one left to like in some of the most fascinating periods of our history. For example... if I place every Victorian anti-Semite beyond the pale of my attention, my compass of available music and literature will be pitifully small. Though I hold no shred of sympathy for active persecution, I cannot excoriate individuals who acquiesced passively in a standard societal judgment. Rail instead against the judgment, and try to understand what motivates men of decent will. *Stephen Jay Gould* (1941-2002)
- If I give you a pfennig, you will be one pfennig richer and I'll be one pfennig poorer. But if I give you an idea, you will have a new idea, but I shall still have it, too. *Albert Einstein* (1879-1955)
- If I were not an atheist, I would believe in a God who would choose to save people on the basis of the totality of their lives and not the pattern of their words. I think he would prefer an honest and righteous atheist to a TV preacher whose every word is God, God, God, and whose every deed is foul, foul, foul. *Isaac Asimov* (1920-1992)

- If I would be a young man again and had to decide how to make my living, I would not try to become a scientist or scholar or teacher. I would rather choose to be a plumber or a peddler in the hope to find that modest degree of independence still available under present circumstances. *Albert Einstein* (1879-1955)
- If I would follow your advice and Jesus could perceive it, he, as a Jewish teacher, surely would not approve of such behavior. *Albert Einstein* (1879-1955)
- If in physics there's something you don't understand, you can always hide behind the uncharted depths of nature. You can always blame God. You didn't make it so complex yourself. But if your program doesn't work, there is no one to hide behind. You cannot hide behind an obstinate nature. If it doesn't work, you've messed up. *Edsger W. Dijkstra* (1930–2002)
- If knowledge can create problems, it is not through ignorance that we can solve them. *Isaac Asimov* (1920-1992)
- If my doctor told me I had only six minutes to live, I wouldn't brood. I'd type a little faster. *Isaac Asimov* (1920-1992)
- If my theory of relativity is proven correct, Germany will claim me as a German and France will say I am a man of the world. If it's proven wrong, France will say I am a German and Germany will say I am a Jew. *Albert Einstein* (1879-1955)
- If my theory of relativity is proven successful, Germany will claim me as a German and France will declare that I am a citizen of the world. Should my theory prove untrue, France will say that I am a German and Germany will declare that I am a Jew. *Albert Einstein* (1879-1955)
- If one has left this entire system to itself for an hour, one would say that the cat still lives if meanwhile no atom has decayed. The psi-function of the entire system would express this by having in it the living and dead cat (pardon the expression) mixed or smeared out in equal parts. *Erwin Schrödinger* (1887-1961)
- If one purges the Judaism of the Prophets and Christianity as Jesus Christ taught it of all subsequent additions, especially those of the priests, one is left with a teaching which is capable of curing all the social ills of humanity. *Albert Einstein* (1879-1955)
- If people are good only because they fear punishment, and hope for reward, then we are a sorry lot indeed. *Albert Einstein* (1879-1955)
- If relativity is proved right the Germans will call me a German, the Swiss will call me a Swiss citizen, and the French will call me a great scientist. If relativity is proved wrong the French will call me a Swiss, the Swiss will call me a German and the Germans will call me a Jew. *Albert Einstein* (1879-1955)
- If texts are unified by a central logic of argument, then their pictorial illustrations are integral to the ensemble, not pretty little trifles included only for aesthetic or commercial value. Primates are visual animals, and (particularly in science) illustration has a language and set of conventions all its own. *Stephen Jay Gould* (1941-2002)
- If the resident zoologist of Galaxy X had visited the earth 5 million years ago while making his inventory of inhabited planets in the universe, he would surely have corrected his earlier report that apes showed more promise than Old World monkeys and noted that monkeys had overcome an original disadvantage to gain domination among primates. (He will confirm this statement after his visit next year - but also add a footnote that one species from the ape bush has enjoyed an unusual and unexpected flowering, thus demanding closer monitoring.) *Stephen Jay Gould* (1941-2002)
- If we knew what it was we were doing, it would not be called research, would it? *Albert Einstein* (1879-1955)
- If you are out to describe the truth, leave elegance to the tailor. *Albert Einstein* (1879-1955)
- If you cannot - in the long run - tell everyone what you have been doing, your doing has been worthless. *Erwin Schrödinger* (1887-1961)



- If you defend a behavior by arguing that people are programmed directly for it, then how do you continue to defend it if your speculation is wrong, for the behavior then becomes unnatural and worthy of condemnation. Better to stick resolutely to a philosophical position on human liberty: what free adults do with each other in their own private lives is their business alone. It need not be vindicated - and must not be condemned - by genetic speculation. *Stephen Jay Gould* (1941-2002)
- If you don't like what you are doing, you can always pick up your needle and move to another groove. *Timothy Francis Leary* (1920-1996)
- If you need statistics, you did the wrong experiment. *Ernest Rutherford* (1871-1937)
- If you take the game of life seriously, if you take your nervous system seriously, if you take your sense organs seriously, if you take the energy process seriously, you must turn on, tune in, and drop out. *Timothy Francis Leary* (1920-1996)
- If you want your children to be intelligent, read them fairy tales. If you want them to be more intelligent, read them more fairy tales. *Albert Einstein* (1879-1955)
- If your experiment needs statistics, you ought to have done a better experiment. *Ernest Rutherford* (1871-1937)
- If your result needs a statistician then you should design a better experiment. *Ernest Rutherford* (1871-1937)
- Ignorance more frequently begets confidence than does knowledge: it is those who know little, not those who know much, who so positively assert that this or that problem will never be solved by science. *Charles Darwin* (1809-1882)
- I'm not an atheist and I don't think I can call myself a pantheist. We are in the position of a little child entering a huge library filled with books in many different languages. The child knows someone must have written those books. It does not know how. The child dimly suspects a mysterious order in the arrangement of the books but doesn't know what it is. That, it seems to me, is the attitude of even the most intelligent human being toward God. *Albert Einstein* (1879-1955)
- Imagination is more important than knowledge. For knowledge is limited, whereas imagination embraces the entire world, stimulating progress, giving birth to evolution. *Albert Einstein* (1879-1955)
- Imagine the people who believe such things and who are not ashamed to ignore, totally, all the patient findings of thinking minds through all the centuries since the Bible was written. And it is these ignorant people, the most uneducated, the most unimaginative, the most unthinking among us, who would make themselves the guides and leaders of us all; who would force their feeble and childish beliefs on us; who would invade our schools and libraries and homes. I personally resent it bitterly. *Isaac Asimov* (1920-1992)
- In Darwin's theory, you just have to substitute 'mutations' for his 'slight accidental variations' (just as quantum theory substitutes 'quantum jump' for 'continuous transfer of energy'). In all other respects little change was necessary in Darwin's theory. *Erwin Schrödinger* (1887-1961)
- In experimental science it's always a mistake not to doubt when facts do not compel you to affirm. *Louis Pasteur* (1822-1895)
- In human freedom in the philosophical sense I am definitely a disbeliever. Everybody acts not only under external compulsion but also in accordance with inner necessity. Schopenhauer's saying, that "a man can do as he will, but not will as he will," has been an inspiration to me since my youth up, and a continual consolation and unending well-spring of patience in the face of the hardships of life, my own and others'. This feeling mercifully mitigates the sense of responsibility which so easily becomes paralysing, and it prevents us from taking ourselves and other people too seriously; it conduces to a view of life in which humour, above all, has its due place. *Albert Einstein* (1879-1955)
- In life, unlike chess, the game continues after checkmate. *Isaac Asimov* (1920-1992)

- In light of new knowledge... an eventual world state is not just desirable in the name of brotherhood, it is necessary for survival... Today we must abandon competition and secure cooperation. This must be the central fact in all our considerations of international affairs; otherwise we face certain disaster. Past thinking and methods did not prevent world wars. Future thinking must prevent wars. *Albert Einstein* (1879-1955)
- In my view, aiming at simplicity and lucidity is a moral duty of all intellectuals: lack of clarity is a sin, and pretentiousness is a crime. *Karl Raimund Popper* (1902-1994)
- In natural history, great discovery often requires a map to a hidden mine filled with gems then easily gathered by conventional tools, not a shiny new space-age machine for penetrating previously inaccessible worlds. *Stephen Jay Gould* (1941-2002)
- In order to form an immaculate member of a flock of sheep one must, above all, be a sheep. *Albert Einstein* (1879-1955)
- In particular, and most importantly, this is the reason why the scientific worldview contains of itself no ethical values, no esthetical values, not a word about our own ultimate scope or destination, and no God, if you please. Whence came I and whither go I? *Erwin Schrödinger* (1887-1961)
- In physics we have dealt hitherto only with periodic crystals. To a humble physicist's mind, these are very interesting and complicated objects; they constitute one of the most fascinating and complex material structures by which inanimate nature puzzles his wits. Yet, compared with the aperiodic crystal, they are rather plain and dull. The difference in structure is of the same kind as that between an ordinary wallpaper in which the same pattern is repeated again and again in regular periodicity and a masterpiece of embroidery, say a Raphael tapestry, which shows no dull repetition, but an elaborate, coherent, meaningful design traced by the great master. *Erwin Schrödinger* (1887-1961)
- In science, "fact" can only mean "confirmed to such a degree that it would be perverse to withhold provisional assent." I suppose that apples might start to rise tomorrow, but the possibility does not merit equal time in physics classrooms. *Stephen Jay Gould* (1941-2002)
- In science there is only physics; all the rest is stamp collecting. *Ernest Rutherford* (1871-1937)
- In scientific work, those who refuse to go beyond fact rarely get as far as fact. *Thomas Henry Huxley* (1825-1895)
- In the case of a Christian clergyman, the tragic-comical is found in this: that the Christian religion demands love from the faithful, even love for the enemy. This demand, because it is indeed superhuman, he is unable to fulfill. Thus intolerance and hatred ring through the oily words of the clergyman. The love, which on the Christian side is the basis for the conciliatory attempt towards Judaism is the same as the love of a child for a cake. That means that it contains the hope that the object of the love will be eaten up. *Albert Einstein* (1879-1955)
- In the good old days physicists repeated each other's experiments, just to be sure. Today they stick to FORTRAN, so that they can share each other's programs, bugs included. *Edsger W. Dijkstra* (1930-2002)
- In the information age, you don't teach philosophy as they did after feudalism. You perform it. If Aristotle were alive today he'd have a talk show. *Timothy Francis Leary* (1920-1996)
- In the matter of physics, the first lessons should contain nothing but what is experimental and interesting to see. A pretty experiment is in itself often more valuable than twenty formulae extracted from our minds. *Albert Einstein* (1879-1955)
- In the struggle for survival, the fittest win out at the expense of their rivals because they succeed in adapting themselves best to their environment. *Charles Darwin* (1809-1882)
- In the temple of science are many mansions, and various indeed are they that dwell therein and the motives that have led them thither. Many take to science out of a joyful sense of superior intellectual power; science is their own special sport to which they look for vivid experience and the satisfaction of ambition; many others are to be found in the temple who have offered the products of their brains on this altar for purely utilitarian purposes. Were an angel of the Lord to

- come and drive all the people belonging to these two categories out of the temple, the assemblage would be seriously depleted, but there would still be some men, of both present and past times, left inside. Our Planck is one of them, and that is why we love him. *Albert Einstein* (1879-1955)
- In view of such harmony in the cosmos which I, with my limited human mind, am able to recognise, there are yet people who say there is no God. But what makes me really angry is that they quote me for support of such views. *Albert Einstein* (1879-1955)
- In what other world is myth so harmless? Great battles kill and maim; great homers and no-hitters are pure joy or deep tragedy without practical consequence... Life is inherently ambiguous; baseball games pit pure good against abject evil. Even Saddam Hussein must have committed one act of kindness in his life, but what iota of good could possibly be said for aluminum bats or the designated hitter rule? *Stephen Jay Gould* (1941-2002)
- Included in this "almost nothing," as a kind of geological afterthought of the last few million years, is the first development of self-conscious intelligence on this planet - an odd and unpredictable invention of a little twig on the mammalian evolutionary bush. Any definition of this uniqueness, embedded as it is in our possession of language, must involve our ability to frame the world as stories and to transmit these tales to others. If our propensity to grasp nature as story has distorted our perceptions, I shall accept this limit of mentality upon knowledge, for we receive in trade both the joys of literature and the core of our being. *Stephen Jay Gould* (1941-2002)
- Individual science fiction stories may seem as trivial as ever to the blinder critics and philosophers of today - but the core of science fiction, its essence, the concept around which it revolves, has become crucial to our salvation if we are to be saved at all. *Isaac Asimov* (1920-1992)
- Innovation is not the product of logical thought, even though the final product is tied to a logical structure. *Albert Einstein* (1879-1955)
- Insanity: doing the same thing over and over again and expecting different results. *Albert Einstein* (1879-1955)
- Intelligence is an extremely subtle concept. It's a kind of understanding that flourishes if it's combined with a good memory, but exists anyway even in the absence of good memory. It's the ability to draw consequences from causes, to make correct inferences, to foresee what might be the result, to work out logical problems, to be reasonable, rational, to have the ability to understand the solution from perhaps insufficient information. You know when a person is intelligent, but you can be easily fooled if you are not yourself intelligent. *Isaac Asimov* (1920-1992)
- Irrationally held truths may be more harmful than reasoned errors. *Thomas Henry Huxley* (1825-1895)
- It cannot be that axioms established by argumentation should avail for the discovery of new works, since the subtlety of nature is greater many times over than the subtlety of argument. But axioms duly and orderly formed from particulars easily discover the way to new particulars, and thus render sciences active. *Sir Francis Bacon* (1561-1626)
- It doesn't matter how beautiful your theory is, it doesn't matter how smart you are. If it doesn't agree with experiment, it's wrong. *Richard Feynman* (1918-1988)
- It followed from the special theory of relativity that mass and energy are both but different manifestations of the same thing - a somewhat unfamiliar conception for the average mind. Furthermore, the equation  $E = mc^2$ , in which energy is put equal to mass, multiplied by the square of the velocity of light, showed that very small amounts of mass may be converted into a very large amount of energy and vice versa. *Albert Einstein* (1879-1955)
- It has become appallingly obvious that our technology has exceeded our humanity. *Albert Einstein* (1879-1955)
- It has often been said, and certainly not without justification, that the man of science is a poor philosopher. Why then should it not be the right thing for the physicist to let the philosopher do the philosophising? Such might indeed be the right thing to do a time when the physicist believes he has at his disposal a rigid system of fundamental laws which are so well established

that waves of doubt can't reach them; but it cannot be right at a time when the very foundations of physics itself have become problematic as they are now. At a time like the present, when experience forces us to seek a newer and more solid foundation, the physicist cannot simply surrender to the philosopher the critical contemplation of theoretical foundations; for he himself knows best and feels more surely where the shoe pinches. In looking for an new foundation, he must try to make clear in his own mind just how far the concepts which he uses are justified, and are necessities. *Albert Einstein* (1879-1955)

It is a scale of proportions which makes the bad difficult and the good easy. *Albert Einstein* (1879-1955)

It is almost a miracle that modern teaching methods have not yet entirely strangled the holy curiosity of inquiry; for what this delicate little plant needs more than anything, besides stimulation, is freedom. *Albert Einstein* (1879-1955)

It is appallingly obvious that our technology exceeds our humanity. *Albert Einstein* (1879-1955)

It is because simplicity and vastness are both beautiful that we seek by preference simple facts and vast facts; that we take delight, now in following the giant courses of the stars, now in scrutinizing the microscope that prodigious smallness which is also a vastness, and now in seeking in geological ages the traces of a past that attracts us because of its remoteness. *Jules Henri Poincaré* (1854-1912)

It is by logic that we prove, but by intuition that we discover. *Jules Henri Poincaré* (1854-1912)

It is change, continuing change, inevitable change, that is the dominant factor in society today. No sensible decision can be made any longer without taking into account not only the world as it is, but the world as it will be... This, in turn, means that our statesmen, our businessmen, our everyman must take on a science fictional way of thinking. *Isaac Asimov* (1920-1992)

It is clear that all the valuable things, material, spiritual, and moral, which we receive from society can be traced back through countless generations to certain creative individuals. The use of fire, the cultivation of edible plants, the steam engine - each was discovered by one man. *Albert Einstein* (1879-1955)

It is easy to follow in the sacred writings of the Jewish people the development of the religion of fear into the moral religion, which is carried further in the New Testament. The religions of all civilized peoples, especially those of the Orient, are principally moral religions. An important advance in the life of a people is the transformation of the religion of fear into the moral religion. *Albert Einstein* (1879-1955)

It is hard to believe that a man is telling the truth when you know that you would lie if you were in his place. *Henry Louis Mencken* (1880-1956)

It is harder to crack a prejudice than an atom. *Albert Einstein* (1879-1955)

It is impossible to imagine the universe run by a wise, just and omnipotent God, but it is quite easy to imagine it run by a board of gods. If such a board actually exists it operates precisely like the board of a corporation that is losing money. *Henry Louis Mencken* (1880-1956)

It is inaccurate to say I hate everything. I am strongly in favor of common sense, common honesty, and common decency. This makes me forever ineligible for any public office. *Henry Louis Mencken* (1880-1956)

It is my view that the vegetarian manner of living by its purely physical effect on the human temperament would most beneficially influence the lot of mankind. *Albert Einstein* (1879-1955)

It is noble to teach oneself, but still nobler to teach others and less trouble. *Mark Twain* (1835-1910)

It is not nature which imposes time and space upon us, it is we who impose them upon nature because we find them convenient. *Jules Henri Poincaré* (1854-1912)

It is not possible to run a course aright when the goal itself has not been rightly placed. *Sir Francis Bacon* (1561-1626)

It is not the fruits of scientific research that elevate man and enrich his nature but the urge to understand, the intellectual work, creative or receptive. *Albert Einstein* (1879-1955)

- It is not the lie that passeth through the mind, but the lie that sinketh in and settleth in it, that doth the hurt. *Sir Francis Bacon* (1561-1626)
- It is not the strongest of the species that survives, nor the most intelligent, but rather the one most responsive to change. *Charles Darwin* (1809-1882)
- It is practically impossible to teach good programming to students that have had a prior exposure to BASIC: as potential programmers they are mentally mutilated beyond hope of regeneration. *Edsger W. Dijkstra* (1930–2002)
- It is so hard for an evolutionary biologist to write about extinction caused by human stupidity... Let me then float an unconventional plea, the inverse of the usual argument... The extinction of *Partula* is unfair to *Partula*. That is the conventional argument, and I do not challenge its primacy. But we need a humanistic ecology as well, both for the practical reason that people will always touch people more than snails do or can, and for the moral reason that humans are legitimately the measure of all ethical questions - for these are our issues, not nature's. *Stephen Jay Gould* (1941-2002)
- It is still believed, apparently, that there is something mysteriously laudable about achieving viable offspring. I have searched the sacred and profane scriptures, for many years, but have yet to find any ground for this notion. To have a child is no more creditable than to have rheumatism - and no more discreditable. Ethically, it is absolutely meaningless. And practically, it is mainly a matter of chance. *Henry Louis Mencken* (1880-1956)
- It is the duty of every citizen according to his best capacities to give validity to his convictions in political affairs. *Albert Einstein* (1879-1955)
- It is the duty of every man of good will to strive steadfastly in his own little world to make this teaching of pure humanity a living force, so far as he can. If he makes an honest attempt in this direction without being crushed and trampled under foot by his contemporaries, he may consider himself and the community to which he belongs lucky. *Albert Einstein* (1879-1955)
- It is the simple hypotheses of which one must be most wary; because these are the ones that have the most chances of passing unnoticed. *Jules Henri Poincaré* (1854-1912)
- It is the theory that decides what can be observed. *Albert Einstein* (1879-1955)
- It is therefore easy to see why the churches have always fought science and persecuted its devotees. On the other hand, I maintain that the cosmic religious feeling is the strongest and noblest motive for scientific research. Only those who realize the immense efforts and, above all, the devotion without which pioneer work in theoretical science cannot be achieved are able to grasp the strength of the emotion out of which alone such work, remote as it is from the immediate realities of life, can issue. What a deep conviction of the rationality of the universe and what a yearning to understand, were it but a feeble reflection of the mind revealed in this world, Kepler and Newton must have had to enable them to spend years of solitary labor in disentangling the principles of celestial mechanics! Those whose acquaintance with scientific research is derived chiefly from its practical results easily develop a completely false notion of the mentality of the men who, surrounded by a skeptical world, have shown the way to kindred spirits scattered wide through the world and through the centuries. Only one who has devoted his life to similar ends can have a vivid realization of what has inspired these men and given them the strength to remain true to their purpose in spite of countless failures. It is cosmic religious feeling that gives a man such strength. A contemporary has said, not unjustly, that in this materialistic age of ours the serious scientific workers are the only profoundly religious people. *Albert Einstein* (1879-1955)
- It is these chromosomes... that contain in some kind of code-script the entire pattern of the individual's future development and of its functioning in the mature state. Every complete set of chromosomes contains the full code. *Erwin Schrödinger* (1887-1961)
- It is this mythical, or rather this symbolic, content of the religious traditions which is likely to come into conflict with science. This occurs whenever this religious stock of ideas contains

dogmatically fixed statements on subjects which belong in the domain of science. Thus, it is of vital importance for the preservation of true religion that such conflicts be avoided when they arise from subjects which, in fact, are not really essential for the pursuance of the religious aims. *Albert Einstein* (1879-1955)

It is through it [intuition] that the mathematical world remains in touch with the real world, and even if pure mathematics could do without it, we should still have to have recourse to it to fill up the gulf that separates the symbol from reality. *Jules Henri Poincaré* (1854-1912)

It is worthy the observing, that there is no passion in the mind of man, so weak, but it mates, and masters, the fear of death; and therefore, death is no such terrible enemy, when a man hath so many attendants about him, that can win the combat of him. Revenge triumphs over death; love slights it; honor aspireth to it; grief flieth to it; fear preoccupieth it. *Sir Francis Bacon* (1561-1626)

It may be doubted whether any character can be named which is distinctive of a race and is constant. *Charles Darwin* (1809-1882)

It may be true, that as Francis Thompson noted, 'Thou canst not stir a flower without troubling a star', but in computing the motion of stars and planets, the effects of flowers do not loom large. It is the disregarding of the effect of flowers on stars that allows progress in astronomy. Appropriate abstraction is critical to progress in science. *Herman Shugart*

It pays to be obvious, especially if you have a reputation for subtlety. *Isaac Asimov* (1920-1992)

It seems plain and self-evident, yet it needs to be said: the isolated knowledge obtained by a group of specialists in a narrow field has in itself no value whatsoever, but only in its synthesis with all the rest of knowledge and only inasmuch as it really contributes in this synthesis toward answering the demand, "Who are we?" *Erwin Schrödinger* (1887-1961)

It seems to me that God is a convenient invention of the human mind. *Isaac Asimov* (1920-1992)

It seems to me that the idea of a personal God is an anthropological concept which I cannot take seriously. I also cannot imagine some will or goal outside the human sphere has been cited as a statement that precedes the last three sentences here, but this might have originated in a paraphrase, a transcription error, or a misquotation; it does not appear in any editions of the essay which have thus far been checked. *Albert Einstein* (1879-1955)

It stands to the everlasting credit of science that by acting on the human mind it has overcome man's insecurity before himself and before nature. *Albert Einstein* (1879-1955)

It takes more than capital to swing business. You've got to have the A. I. D. degree to get by - Advertising, Initiative, and Dynamics. *Isaac Asimov* (1920-1992)

It was, of course, a lie what you read about my religious convictions, a lie which is being systematically repeated. I do not believe in a personal God and I have never denied this but have expressed it clearly. If something is in me which can be called religious then it is the unbounded admiration for the structure of the world so far as our science can reveal it. *Albert Einstein* (1879-1955)

It would be an unsound fancy and self-contradictory to expect that things which have never yet been done can be done except by means which have never yet been tried. *Sir Francis Bacon* (1561-1626)

It would not be difficult to come to an agreement as to what we understand by science. Science is the century-old endeavor to bring together by means of systematic thought the perceptible phenomena of this world into as thoroughgoing an association as possible. To put it boldly, it is the attempt at the posterior reconstruction of existence by the process of conceptualization. But when asking myself what religion is I cannot think of the answer so easily. And even after finding an answer which may satisfy me at this particular moment, I still remain convinced that I can never under any circumstances bring together, even to a slight extent, the thoughts of all those who have given this question serious consideration. *Albert Einstein* (1879-1955)

It's not that I'm so smart, it's just that I stay with problems longer. *Albert Einstein* (1879-1955)

It's so hard to know what to do when one wishes earnestly to do right. *George Bernard Shaw* (1856-1950)

I've come loaded with statistics, for I've noticed that a man can't prove anything without statistics. *Mark Twain* (1835-1910)

I've never let my school interfere with my education. *Mark Twain* (1835-1910)

Jesus is too colossal for the pen of phrasemongers, however artful. No man can dispose of Christianity with a *bon mot*. *Albert Einstein* (1879-1955)

John Dalton's records, carefully preserved for a century, were destroyed during the World War II bombing of Manchester. It is not only the living who are killed in war. *Isaac Asimov* (1920-1992)

Justice is justice though it's always delayed and finally done only by mistake. *George Bernard Shaw* (1856-1950)

Knowledge and wonder are the dyad of our worthy lives as intellectual beings. Voyager did wonders for our knowledge, but performed just as mightily in the service of wonder - and the two elements are complementary, not independent or opposed. The thought fills me with awe - a mechanical contraption that could fit in the back of a pickup truck, traveling through space for twelve years, dodging around four giant bodies and their associated moons, and finally sending exquisite photos across more than four light-hours of space from the farthest planet in our solar system. *Stephen Jay Gould* (1941-2002)

Knowledge, feeling, and choice are essentially eternal and unchangeable and numerically one in all men, nay in all sensitive beings. *Erwin Schrödinger* (1887-1961)

Knowledge is indivisible. When people grow wise in one direction, they are sure to make it easier for themselves to grow wise in other directions as well. On the other hand, when they split up knowledge, concentrate on their own field, and scorn and ignore other fields, they grow less wise - even in their own field. *Isaac Asimov* (1920-1992)

Knowledge is limited. Imagination encircles the world. *Albert Einstein* (1879-1955)

Knowledge is power. *Sir Francis Bacon* (1561-1626)

Lavoisier was right in the deepest, almost holy, way. His passion harnessed feeling to the service of reason; another kind of passion was the price. Reason cannot save us and can even persecute us in the wrong hands; but we have no hope of salvation without reason. The world is too complex, too intransigent; we cannot bend it to our simple will. *Stephen Jay Gould* (1941-2002)

Laws alone can not secure freedom of expression; in order that every man present his views without penalty there must be spirit of tolerance in the entire population. *Albert Einstein* (1879-1955)

Let me tell you the secret that has led me to my goal: my strength lies solely in my tenacity. *Louis Pasteur* (1822-1895)

Life does not cease to be funny when people die any more than it ceases to be serious when people laugh. *George Bernard Shaw* (1856-1950)

Life is a journey, but don't worry, you'll find a parking spot at the end. *Isaac Asimov* (1920-1992)

Life is like riding a bicycle. To keep your balance you must keep moving. *Albert Einstein* (1879-1955)

Life is no brief candle to me. It is a sort of splendid torch which I have got a hold of for the moment, and I want to make it burn as brightly as possible before handing it on to future generations. *George Bernard Shaw* (1856-1950)

Life is pleasant. Death is peaceful. It's the transition that's troublesome. *Isaac Asimov* (1920-1992)

Logic teaches us that on such and such a road we are sure of not meeting an obstacle; it does not tell us which is the road that leads to the desired end. For this, it is necessary to see the end from afar, and the faculty which teaches us to see is intuition. Without it, the geometrician would be like a writer well up in grammar but destitute of ideas. *Jules Henri Poincaré* (1854-1912)

Man, being the servant and interpreter of Nature, can do and understand so much and so much only as he has observed in fact or in thought of the course of nature. Beyond this he neither knows anything nor can do anything. *Sir Francis Bacon* (1561-1626)

MAN, some modern philosophers tell us, is alienated from his world: he is a stranger and afraid in a world he never made. Perhaps he is; yet so are animals, and even plants. They too were born, long ago, into a physico-chemical world, a world they never made. *Karl Raimund Popper* (1902-1994)

Man tries to make for himself in the fashion that suits him best a simplified and intelligible picture of the world; he then tries to some extent to substitute this cosmos of his for the world of experience, and thus to overcome it. This is what the painter, the poet, the speculative philosopher, and the natural scientist do, each in his own fashion. Each makes this cosmos and its construction the pivot of his emotional life, in order to find in this way the peace and security which he cannot find in the narrow whirlpool of personal experience. *Albert Einstein* (1879-1955)

Many persons have inquired concerning a recent message of mine that "a new type of thinking is essential if mankind is to survive and move to higher levels." *Albert Einstein* (1879-1955)

Marriage is a wonderful institution, but who would want to live in an institution? *Henry Louis Mencken* (1880-1956)

Mathematicians do not study objects, but the relations between objects; to them it is a matter of indifference if these objects are replaced by others, provided that the relations do not change. Matter does not engage their attention, they are interested in form alone. *Jules Henri Poincaré* (1854-1912)

Mathematics seems to endow one with something like a new sense. *Charles Darwin* (1809-1882)

Matter and energy seem granular in structure, and so does 'life', but not so mind. *Erwin Schrödinger* (1887-1961)

Matter and mind are not separate, they are aspects of one energy. Look at the mind as a function of matter and you have science; look at matter as the product of the mind and you have religion. *Sri Nisargadatta Maharaj*

May the conscience and the common sense of the peoples be awakened, so that we may reach a new stage in the life of nations, where people will look back on war as an incomprehensible aberration of their forefathers! *Albert Einstein* (1879-1955)

Measured objectively, what a man can wrest from Truth by passionate striving is utterly infinitesimal. But the striving frees us from the bonds of the self and makes us comrades of those who are the best and the greatest. *Albert Einstein* (1879-1955)

Memory is a fascinating trickster. Words and images have enormous power and can easily displace actual experience over the years. *Stephen Jay Gould* (1941-2002)

Men are wise in proportion, not to their experience, but to their capacity for experience. *George Bernard Shaw* (1856-1950)

Men become civilized, not in proportion to their willingness to believe, but in proportion to their readiness to doubt. *Henry Louis Mencken* (1880-1956)

Men fear death as children fear to go in the dark; and as that natural fear in children is increased with tales, so is the other. *Sir Francis Bacon* (1561-1626)

Men have a much better time of it than women; for one thing, they marry later; for another thing they die earlier. *Henry Louis Mencken* (1880-1956)

Modern anthropology has taught us, through comparative investigation of so-called primitive cultures, that the social behavior of human beings may differ greatly, depending upon prevailing cultural patterns and the types of organisation which predominate in society. It is on this that those who are striving to improve the lot of man may ground their hopes: human beings are not condemned, because of their biological constitution, to annihilate each other or to be at the mercy of a cruel, self-inflicted fate. *Albert Einstein* (1879-1955)



- Most books, after all, are ephemeral; their specifics, several years later, inspire about as much interest as daily battle reports from the Hundred Years' War. *Stephen Jay Gould* (1941-2002)
- Most impediments to scientific understanding are conceptual locks, not factual lacks. Most difficult to dislodge are those biases that escape our scrutiny because they seem so obviously, even ineluctably, just. We know ourselves best and tend to view other creatures as mirrors of our own constitution and social arrangements. (Aristotle, and nearly two millennia of successors, designated the large bee that leads the swarm as a king.) *Stephen Jay Gould* (1941-2002)
- Multiplicity is only apparent, in truth, there is only one mind. *Erwin Schrödinger* (1887-1961)
- My passion for social justice has often brought me into conflict with people, as did my aversion to any obligation and dependence I do not regard as absolutely necessary. I always have a high regard for the individual and have an insuperable distaste for violence and clubmanship. *Albert Einstein* (1879-1955)
- My passionate sense of social justice and social responsibility has always contrasted oddly with my pronounced lack of need for direct contact with other human beings and human communities. *Albert Einstein* (1879-1955)
- My political ideal is democracy. Let every man be respected as an individual and no man idolised. It is an irony of fate that I myself have been the recipient of excessive admiration and reverence from my fellow-beings, through no fault, and no merit, of my own. The cause of this may well be the desire, unattainable for many, to understand the few ideas to which I have with my feeble powers attained through ceaseless struggle. I am quite aware that for any organisation to reach its goals, one man must do the thinking and directing and generally bear the responsibility. But the led must not be coerced, they must be able to choose their leader. *Albert Einstein* (1879-1955)
- My profession often gets bad press for a variety of sins, both actual and imagined: arrogance, venality, insensitivity to moral issues about the use of knowledge, pandering to sources of funding with insufficient worry about attendant degradation of values. As an advocate for science, I plead "mildly guilty now and then" to all these charges. Scientists are human beings subject to all the foibles and temptations of ordinary life. Some of us are moral rocks; others are reeds. I like to think (though I have no proof) that we are better, on average, than members of many other callings on a variety of issues central to the practice of good science: willingness to alter received opinion in the face of uncomfortable data, dedication to discovering and publicizing our best and most honest account of nature's factuality, judgment of colleagues on the might of their ideas rather than the power of their positions. *Stephen Jay Gould* (1941-2002)
- My religion consists of a humble admiration of the illimitable superior spirit who reveals himself in the slight details we are able to perceive with our frail and feeble mind. *Albert Einstein* (1879-1955)
- My visceral perception of brotherhood harmonizes with our best modern biological knowledge... Many people think (or fear) that equality of human races represents a hope of liberal sentimentality probably squashed by the hard realities of history. They are wrong. This essay can be summarized in a single phrase, a motto if you will: Human equality is a contingent fact of history. Equality is not true by definition; it is neither an ethical principle (though equal treatment may be) nor a statement about norms of social action. It just worked out that way. A hundred different and plausible scenarios for human history would have yielded other results (and moral dilemmas of enormous magnitude). They didn't happen. *Stephen Jay Gould* (1941-2002)
- Mythology is wondrous, a balm for the soul. But its problems cannot be ignored. At worst, it buys inspiration at the price of physical impossibility... At best, it purveys the same myopic view of history that made this most fascinating subject so boring and misleading in grade school as a sequential take of monarchs and battles. *Stephen Jay Gould* (1941-2002)
- Nationalism is an infantile disease. It is the measles of mankind. *Albert Einstein* (1879-1955)

Natural historians tend to avoid tendentious preaching in this philosophical mode (although I often fall victim to such temptations in these essays). Our favored style of doubting is empirical: if I wish to question your proposed generality, I will search for a counterexample in flesh and blood. Such counterexamples exist in abundance, for the form a staple in a standard genre of writing in natural history - the "wonderment of oddity" or "strange ways of the beaver" tradition. *Stephen Jay Gould* (1941-2002)

Nature has no reverence towards life. Nature treats life as though it were the most valueless thing in the world... Nature does not act by purposes. *Erwin Schrödinger* (1887-1961)

Nature hides her secret because of her essential loftiness, but not by means of ruse. *Albert Einstein* (1879-1955)

Nature is objective, and nature is knowable, but we can only view her through a glass darkly - and many clouds upon our vision are of our own making: social and cultural biases, psychological preferences, and mental limitations (in universal modes of thought, not just individualized stupidity). *Stephen Jay Gould* (1941-2002)

Nature shows us only the tail of the lion. But I do not doubt that the lion belongs to it even though he cannot at once reveal himself because of his enormous size. *Albert Einstein* (1879-1955)

Nearly anyone in this line of work would take a bullet for the last pregnant dodo. But should we not admire the person who, when faced with an overwhelmingly sad reality beyond and personal blame or control, strives valiantly to rescue whatever can be salvaged, rather than retreating to the nearest corner to weep or assign fault? *Stephen Jay Gould* (1941-2002)

Never do anything against conscience even if the state demands it. *Albert Einstein* (1879-1955)

Never let your sense of morals prevent you from doing what is right. *Isaac Asimov* (1920-1992)

Never lose a holy curiosity. *Albert Einstein* (1879-1955)

Never memorize what you can look up in books. *Albert Einstein* (1879-1955)

Nevertheless, it is necessary to remember that a planned economy is not yet socialism. A planned economy as such may be accompanied by the complete enslavement of the individual. The achievement of socialism requires the solution of some extremely difficult socio-political problems: how is it possible, in view of the far-reaching centralisation of political and economic power, to prevent bureaucracy from becoming all-powerful and overweening? How can the rights of the individual be protected and therewith a democratic counterweight to the power of bureaucracy be assured? *Albert Einstein* (1879-1955)

Nirvana is a state of pure blissful knowledge... It has nothing to do with the individual. The ego or its separation is an illusion. Indeed in a certain sense two "I"s are identical namely when one disregards all special contents - their Karma. The goal of man is to preserve his Karma and to develop it further... when man dies his Karma lives and creates for itself another carrier. *Erwin Schrödinger* (1887-1961)

No amount of experimentation can ever prove me right; a single experiment can prove me wrong. *Albert Einstein* (1879-1955)

No man who is occupied in doing a very difficult thing, and doing it very well, ever loses his self-respect. *George Bernard Shaw* (1856-1950)

No married woman ever trusts her husband absolutely, nor does she ever act as if she did trust him. Her utmost confidence is as wary as an American pickpocket's confidence that the policeman on the beat will stay bought. *Henry Louis Mencken* (1880-1956)

No more harmful nonsense exists than the common supposition that deepest insight into great questions about the meaning of life or the structure of reality emerges most readily when a free, undisciplined, and uncluttered (read, rather, ignorant and uneducated) mind soars above mere earthly knowledge and concern. *Stephen Jay Gould* (1941-2002)

No one can read the Gospels without feeling the actual presence of Jesus. His personality pulsates in every word. No myth is filled with such life. *Albert Einstein* (1879-1955)

- No one has ever heard of a reformed pickpocket; he exists only in the dreams of sentimental penologists. He may give up the business when his eyes give out, or his fingers get too stiff, but so long as he can snatch a pocketbook and get away he will keep at it. And yet, so absurd is our law that we try to cure him by making him stop temporarily - by locking him up for two or three years, or maybe for only six months. As well try to cure a poet by forbidding him, for six months, to get drunk. *Henry Louis Mencken* (1880-1956)
- No one has yet been found so firm of mind and purpose as resolutely to compel himself to sweep away all theories and common notions, and to apply the understanding, thus made fair and even, to a fresh examination of particulars. Thus it happens that human knowledge, as we have it, is a mere medley and ill-digested mass, made up of much credulity and much accident, and also of the childish notions which we at first imbibed. *Sir Francis Bacon* (1561-1626)
- No one should feel at all offended or threatened by the obvious fact that we are not all born entirely blank, or entirely the same, in our mixture of the broad behavioral propensities defining what we call "temperament." *Stephen Jay Gould* (1941-2002)
- No pleasure is comparable to the standing upon the vantage-ground of truth. *Sir Francis Bacon* (1561-1626)
- No problem can be solved from the same consciousness that created it. *Albert Einstein* (1879-1955)
- No question is so difficult to answer as that which the answer is obvious. *George Bernard Shaw* (1856-1950)
- No race of men has every punished violations of the moral code as severely as they are punished by the lower animals. Among tigers, lions, hyenas, jackals, elephants, leopards, cougars and wolves the punishment for adultery is death. This surely beats the Unitarians. *Henry Louis Mencken* (1880-1956)
- No self is of itself alone. It has a long chain of intellectual ancestors. The "I" is chained to ancestry by many factors... This is not mere allegory, but an eternal memory. *Erwin Schrödinger* (1887-1961)
- No, this trick wont work... How on earth are you ever going to explain in terms of chemistry and physics so important a biological phenomenon as first love? *Albert Einstein* (1879-1955)
- Nobody, certainly, will deny that the idea of the existence of an omnipotent, just, and omnibeneficent personal God is able to accord man solace, help, and guidance; also, by virtue of its simplicity it is accessible to the most undeveloped mind. But, on the other hand, there are decisive weaknesses attached to this idea in itself, which have been painfully felt since the beginning of history. That is, if this being is omnipotent, then every occurrence, including every human action, every human thought, and every human feeling and aspiration is also His work; how is it possible to think of holding men responsible for their deeds and thoughts before such an almighty Being? In giving out punishment and rewards He would to a certain extent be passing judgment on Himself. How can this be combined with the goodness and righteousness ascribed to Him? *Albert Einstein* (1879-1955)
- Not everything that counts can be counted, and not everything that can be counted counts. *Albert Einstein* (1879-1955)
- Nothing in this world is to be feared... only understood. *Marie Curie* (1867-1934)
- Nothing interferes with my concentration. You could put on an orgy in my office and I wouldn't look up. Well, maybe once. *Isaac Asimov* (1920-1992)
- Nothing will benefit human health and increase chances for survival of life on Earth as much as the evolution to a vegetarian diet. *Albert Einstein* (1879-1955)
- Now any dogma, based primarily on faith and emotionalism, is a dangerous weapon to use on others, since it is almost impossible to guarantee that the weapon will never be turned on the user. *Isaac Asimov* (1920-1992)

- Now he has departed from this strange world a little ahead of me. That means nothing. People like us, who believe in physics, know that the distinction between past, present, and future is only a stubbornly persistent illusion. *Albert Einstein* (1879-1955)
- Now when naturalists observe a close agreement in numerous small details of habits, tastes, and dispositions between two or more domestic races, or between nearly-allied natural forms, they use this fact as an argument that they are descended from a common progenitor who was thus endowed; and consequently that all should be classed under the same species. The same argument may be applied with much force to the races of man. *Charles Darwin* (1809-1882)
- Object-oriented programming is an exceptionally bad idea which could only have originated in California. *Edsger W. Dijkstra* (1930–2002)
- Of all the damnable waste of human life that ever was invented, clerking is the worst. *George Bernard Shaw* (1856-1950)
- Of what significance is one's one existence, one is basically unaware. What does a fish know about the water in which he swims all his life? The bitter and the sweet come from outside. The hard from within, from one's own efforts. For the most part I do what my own nature drives me to do. It is embarrassing to earn such respect and love for it. *Albert Einstein* (1879-1955)
- Often in evolutionary processes a species must adapt to new conditions in order to survive. Today the atomic bomb has altered profoundly the nature of the world as we know it, and the human race consequently finds itself in a new habitat to which it must adapt its thinking. *Albert Einstein* (1879-1955)
- On principle, there is nothing new in the postulate that in the end exact science should aim at nothing more than the description of what can really be observed. The question is only whether from now on we shall have to refrain from tying description to a clear hypothesis about the real nature of the world. There are many who wish to pronounce such abdication even today. But I believe that this means making things a little too easy for oneself. *Erwin Schrödinger* (1887-1961)
- On quantum theory I use up more brain grease than on relativity. *Albert Einstein* (1879-1955)
- On the other hand, I maintain that the cosmic religious feeling is the strongest and noblest motive for scientific research. *Albert Einstein* (1879-1955)
- Once you can accept the universe as matter expanding into nothing that is something, wearing stripes with plaid comes easy. *Albert Einstein* (1879-1955)
- One general law, leading to the advancement of all organic beings, namely, multiply, vary, let the strongest live and the weakest die. *Charles Darwin* (1809-1882)
- One has a feeling that one has a kind of home in this timeless community of human beings that strive for truth... I have always believed that Jesus meant by the Kingdom of God the small group scattered all through time of intellectually and ethically valuable people. *Albert Einstein* (1879-1955)
- One horse-laugh is worth ten thousand syllogisms. It is not only more effective; it is also vastly more intelligent. *Henry Louis Mencken* (1880-1956)
- One may say the eternal mystery of the world is its comprehensibility. *Albert Einstein* (1879-1955)
- One of the greatest gifts science has brought to the world is continuing elimination of the supernatural, and it was a lesson that my father passed on to me, that knowledge liberates mankind from superstition. We can live our lives without the constant fear that we have offended this or that deity who must be placated by incantation or sacrifice, or that we are at the mercy of devils or the Fates. With increasing knowledge, the intellectual darkness that surrounds us is illuminated and we learn more of the beauty and wonder of the natural world. *James D. Watson* (1928- )
- One of the strongest motives that lead men to art and science is escape from everyday life with its painful crudity and hopeless dreariness, from the fetters of one's own ever-shifting desires. A

finely tempered nature longs to escape from the personal life into the world of objective perception and thought. *Albert Einstein* (1879-1955)

One reason why mathematics enjoys special esteem, above all other sciences, is that its laws are absolutely certain and indisputable, while those of other sciences are to some extent debatable and in constant danger of being overthrown by newly discovered facts. *Albert Einstein* (1879-1955)

One should guard against preaching to young people success in the customary form as the main aim in life. The most important motive for work in school and in life is pleasure in work, pleasure in its result, and the knowledge of the value of the result to the community. *Albert Einstein* (1879-1955)

One strength of the communist system of the East is that it has some of the character of a religion and inspires the emotions of a religion. *Albert Einstein* (1879-1955)

One thing I have learned in a long life: All our science, measured against reality, is primitive and childlike - and yet it is the most precious thing we have. *Albert Einstein* (1879-1955)

One would suppose that the battle for religious liberty was won in the United States two hundred years ago. However, in the time since, and right now, powerful voices are always raised in favor of bigotry and thought control. *Isaac Asimov* (1920-1992)

Only a life lived for others is a life worthwhile. *Albert Einstein* (1879-1955)

Only one who devotes himself to a cause with his whole strength and soul can be a true master. For this reason mastery demands all of a person. *Albert Einstein* (1875-1955)

Only the individual can think, and thereby create new values for society - nay, even set up new moral standards to which the life of the community conforms. Without creative, independently thinking and judging personalities the upward development of society is as unthinkable as the development of the individual personality without the nourishing soil of the community. *Albert Einstein* (1875-1955)

Only two things are infinite, the universe and human stupidity, and I'm not sure about the former. *Albert Einstein* (1879-1955)

Only two things are infinite, the universe and the stupidity of mankind, and I'm not sure about the former. *Albert Einstein* (1879-1955)

Organisms... are directed and limited by their past. They must remain imperfect in their form and function, and to that extent unpredictable since they are not optimal machines. We cannot know their future with certainty, if only because a myriad of quirky functional shifts lie within the capacity of any feature, however well adapted to a present role. *Stephen Jay Gould* (1941-2002)

Organisms are not billiard balls, propelled by simple and measurable external forces to predictable new positions on life's pool table. Sufficiently complex systems have greater richness. Organisms have a history that constrains their future in myriad, subtle ways. *Stephen Jay Gould* (1941-2002)

Orthodoxy can be as stubborn in science as in religion. I do not know how to shake it except by vigorous imagination that inspires unconventional work and contains within itself an elevated potential for inspired error. As the great Italian economist Vilfredo Pareto wrote: "Give me a fruitful error any time, full of seeds, bursting with its own corrections. You can keep your sterile truth for yourself." Not to mention a man named Thomas Henry Huxley who, when not in the throes of grief or the wars of parson hunting, argued that "irrationally held truths may be more harmful than reasoned errors." *Stephen Jay Gould* (1941-2002)

Our discombobulated lives need to sink some anchors in numerical stability. (I still have not recovered from the rise of a pound of hamburger at the supermarket to more than a buck.) *Stephen Jay Gould* (1941-2002)

Our failure to discern a universal good does not record any lack of insight or ingenuity, but merely demonstrates that nature contains no moral messages framed in human terms. Morality is a subject for philosophers, theologians, students of the humanities, indeed for all thinking people.

- The answers will not be read passively from nature; they do not, and cannot, arise from the data of science. The factual state of the world does not teach us how we, with our powers for good and evil, should alter or preserve it in the most ethical manner. *Stephen Jay Gould* (1941-2002)
- Our indirect methods have taught us a mountain of things about horses, but if you wished to learn even more, would you rather be Whirlaway in the stretch, than interview Eddie Arcaro afterwards? *Stephen Jay Gould* (1941-2002)
- Our mind, by virtue of a certain finite, limited capability, is by no means capable of putting a question to Nature that permits a continuous series of answers. The observations, the individual results of measurements, are the answers of Nature to our discontinuous questioning. *Erwin Schrödinger* (1887-1961)
- Our situation on this earth seems strange. Every one of us appears here involuntarily and uninvited for a short stay, without knowing the whys and the wherefore. In our daily lives we only feel that man is here for the sake of others, for those whom we love and for many other beings whose fate is connected with our own. I am often worried at the thought that my life is based to such a large extent on the work of my fellow human beings and I am aware of my great indebtedness to them. *Albert Einstein* (1879-1955)
- Our time is distinguished by wonderful achievements in the fields of scientific understanding and the technical application of those insights. Who would not be cheered by this? But let us not forget that human knowledge and skills alone cannot lead humanity to a happy and dignified life. Humanity has every reason to place the proclaimers of high moral standards and values above the discoverers of objective truth. *Albert Einstein* (1875-1955)
- Our world is not an optimal place, fine tuned by omnipotent forces of selection. It is a quirky mass of imperfections, working well enough (often admirably); a jury-rigged set of adaptations built of curious parts made available by past histories in different contexts... A world optimally adapted to current environments is a world without history, and a world without history might have been created as we find it. History matters; it confounds perfection and proves that current life transformed its own past. *Stephen Jay Gould* (1941-2002)
- Outside intelligences, exploring the Solar System with true impartiality, would be quite likely to enter the Sun in their records thus: Star X, spectral class G0, 4 planets plus debris. *Isaac Asimov* (1920-1992)
- Overwhelming evidences of an intelligence and benevolent intention surround us, show us the whole of nature through the work of a free will and teach us that all alive beings depend on an eternal creator-ruler. *Lord Kelvin* (1824-1907)
- Owing to this struggle for life, any variation, however slight and from whatever cause proceeding, if it be in any degree profitable to an individual of any species, in its infinitely complex relationship to other organic beings and to external nature, will tend to the preservation of that individual, and will generally be inherited by its offspring. *Charles Darwin* (1809-1882)
- Part of the inhumanity of the computer is that, once it is competently programmed and working smoothly, it is completely honest. *Isaac Asimov* (1920-1992)
- Peace cannot be kept by force. It can only be achieved by understanding. *Albert Einstein* (1875-1955)
- People are entirely too disbelieving of coincidence. They are far too ready to dismiss it and to build arcane structures of extremely rickety substance in order to avoid it. I, on the other hand, see coincidence everywhere as an inevitable consequence of the laws of probability, according to which having no unusual coincidence is far more unusual than any coincidence could possibly be. *Isaac Asimov* (1920-1992)
- People exaggerate the value of things they haven't got: everybody worships truth and unselfishness because they have no experience with them. *George Bernard Shaw* (1856-1950)

- People turn, in all the great emergencies of life, to the ancient promises, transparently false but immensely comforting, and of all those ancient promises there is none more comforting than the one to the effect that the lowly shall inherit the earth. *Henry Louis Mencken* (1880-1956)
- Perhaps I am just a hopeless rationalist, but isn't fascination as comforting as solace? Isn't nature immeasurably more interesting for its complexities and its lack of conformity to our hopes? Isn't curiosity as wondrously and fundamentally human as compassion? *Stephen Jay Gould* (1941-2002)
- Perhaps randomness is not merely an adequate description for complex causes that we cannot specify. Perhaps the world really works this way, and many events are uncaused in any conventional sense of the word. Perhaps our gut feeling that it cannot be so reflects only our hopes and prejudices, our desperate striving to make sense of a complex and confusing world, and not the ways of nature. *Stephen Jay Gould* (1941-2002)
- Phenomena unfold on their own appropriate scales of space and time and may be invisible in our myopic world of dimensions assessed by comparison with human height and times metered by human lifespans. So much of accumulating importance at earthly scales... is invisible by the measuring rod of a human life. So much that matters to particles in the microscopic world of molecules... either averages out to stability at our scale or simply stands below our limits of perception. *Stephen Jay Gould* (1941-2002)
- Phony psychics like Uri Geller have had particular success in bamboozling scientists with ordinary stage magic, because only scientists are arrogant enough to think that they always observe with rigorous and objective scrutiny, and therefore could never be so fooled - while ordinary mortals know perfectly well that good performers can always find a way to trick people. *Stephen Jay Gould* (1941-2002)
- Physical concepts are free creations of the human mind, and are not, however it may seem, uniquely determined by the external world. In our endeavor to understand reality we are somewhat like a man trying to understand the mechanism of a closed watch. He sees the face and the moving hands, even hears its ticking, but he has no way of opening the case. If he is ingenious he may form some picture of a mechanism which could be responsible for all the things he observes, but he may never be quite sure his picture is the only one which could explain his observations. He will never be able to compare his picture with the real mechanism and he cannot even imagine the possibility or the meaning of such a comparison. But he certainly believes that, as his knowledge increases, his picture of reality will become simpler and simpler and will explain a wider and wider range of his sensuous impressions. He may also believe in the existence of the ideal limit of knowledge and that it is approached by the human mind. He may call this ideal limit the objective truth. *Albert Einstein* (1879-1955)
- Physics is like sex: Sure, it may have practical results, but that is not the reason we do it. *Richard Feynman* (1918-1988)
- Physiological experiment on animals is justifiable for real investigation, but not for mere damnable and detestable curiosity. *Charles Darwin* (1809-1882)
- Pity and compassion are words appropriated to signify our fellow-feeling with the sorrow of others. Sympathy, though its meaning was, perhaps, originally the same, may now, however, without much impropriety, be made use of to denote our fellow-feeling with any passion whatever. *Adam Smith* (1723-1790)
- Prediction is very difficult, especially about the future. *Niels Bohr* (1885-1962)
- Probably I am very naive, but I also think I prefer to remain so, at least for the time being and perhaps for the rest of my life. *Edsger W. Dijkstra* (1930-2002)
- Problems cannot be solved by the level of awareness that created them. *Albert Einstein* (1879-1955)
- Program testing can be a very effective way to show the presence of bugs, but is hopelessly inadequate for showing their absence. *Edsger W. Dijkstra* (1930-2002)

Program testing can be used to show the presence of bugs, but never to show their absence! *Edsger W. Dijkstra* (1930–2002)

Programming is one of the most difficult branches of applied mathematics; the poorer mathematicians had better remain pure mathematicians. *Edsger W. Dijkstra* (1930–2002)

Progress is the process whereby the human race is getting rid of whiskers, the veriform appendix and God. *Henry Louis Mencken* (1880-1956)

Properly read, the Bible is the most potent force for atheism ever conceived. *Isaac Asimov* (1920-1992)

Psychotherapy - the theory that the patient will probably get well anyhow. *Henry Louis Mencken* (1880-1956)

Pure mathematics is, in its way, the poetry of logical ideas. One seeks the most general ideas of operation which will bring together in simple, logical and unified form the largest possible circle of formal relationships. In this effort toward logical beauty spiritual formulas are discovered necessary for the deeper penetration into the laws of nature. *Albert Einstein* (1879-1955)

Put your hand on a hot stove for a minute, and it seems like an hour. Sit with a pretty girl for an hour, and it seems like a minute. That's relativity. *Albert Einstein* (1879-1955)

Quantum mechanics is certainly imposing. But an inner voice tells me that it is not yet the real thing. The theory says a lot, but does not really bring us any closer to the secret of the Old One. I, at any rate, am convinced that He does not throw dice. *Albert Einstein* (1879-1955)

Read no newspapers, try to find a few friends who think as you do, read the wonderful writers of earlier times, Kant, Goethe, Lessing, and the classics of other lands, and enjoy the natural beauties of Munich's surroundings. Make believe all the time that you are living, so to speak, on Mars among alien creatures and blot out any deeper interest in the actions of those creatures. Make friends with a few animals. Then you will become a cheerful man once more and nothing will be able to trouble you. *Albert Einstein* (1879-1955)

Reading, after a certain age, diverts the mind too much from its creative pursuits. Any man who reads too much and uses his own brain too little falls into lazy habits of thinking. *Albert Einstein* (1879-1955)

Reality is merely an illusion, albeit a very persistent one. *Albert Einstein* (1879-1955)

Reasonable people adapt themselves to the world. Unreasonable people attempt to adapt the world to themselves. All progress, therefore, depends on unreasonable people. *George Bernard Shaw* (1856-1950)

Relativity applies to physics, not ethics. *Albert Einstein* (1879-1955)

Religions, in fact, like castles, sunsets and women, never reach their maximum of beauty until they are touched by decay. *Henry Louis Mencken* (1880-1956)

Remember that all models are wrong; the practical question is how wrong do they have to be to not be useful. *George Edward Pelham Box* (1919- )

Results rarely specify their causes unambiguously. If we have no direct evidence of fossils or human chronicles, if we are forced to infer a process only from its modern results, then we are usually stymied or reduced to speculation about probabilities. For many roads lead to almost any Rome. *Stephen Jay Gould* (1941-2002)

Revenge is a kind of wild justice; which the more man's nature runs to, the more ought law to weed it out. *Sir Francis Bacon* (1561-1626)

Say what you will about the ten commandments, you must always come back to the pleasant fact that there are only ten of them. *Henry Louis Mencken* (1880-1956)

Science can progress on the basis of error as long as it is not trivial. *Albert Einstein* (1879-1955)

Science cannot tell us a word about why music delights us, of why and how an old song can move us to tears. *Erwin Schrödinger* (1887-1961)



Science has never sought to ally herself with civil power. She has never subjected anyone to mental torment, physical torment, least of all death, for the purpose of promoting her ideas. *John William Draper* (1811-1882)

Science, in the immediate, produces knowledge and, indirectly, means of action. It leads to methodical action if definite goals are set up in advance. For the function of setting up goals and passing statements of value transcends its domain. While it is true that science, to the extent of its grasp of causative connections, may reach important conclusions as to the compatibility and incompatibility of goals and evaluations, the independent and fundamental definitions regarding goals and values remain beyond science's reach. *Albert Einstein* (1879-1955)

Science is a method for testing claims about the natural world, not an immutable compendium of absolute truths. The fundamentalists, by "knowing" the answers before they start, and then forcing nature into the straitjacket of their discredited preconceptions, lie outside the domain of science - or of any honest intellectual inquiry. *Stephen Jay Gould* (1941-2002)

Science is a wonderful thing if one does not have to earn one's living at it. *Albert Einstein* (1879-1955)

Science is all metaphor. *Timothy Francis Leary* (1920-1996)

Science is always wrong. It never solves a problem without creating ten more. *George Bernard Shaw* (1856-1950)

Science is built up with facts, as a house is with stones. But a collection of facts is no more a science than a heap of stones is a house. *Jules Henri Poincaré* (1854-1912)

Science is often regarded as the most objective and truth-directed of human enterprises, and since direct observation is supposed to be the favored route to factuality, many people equate respectable science with visual scrutiny - just the facts ma'am, and palpably before my eyes. But science is a battery of observational and inferential methods, all directed to the testing of propositions that can, in principle, be definitely proven false... At all scales, from smallest to largest, quickest to slowest, many well-documented conclusions of science lie beyond the strictly limited domain of direct observation. No one has ever seen an electron or a black hole, the events of a picosecond or a geological eon. *Stephen Jay Gould* (1941-2002)

Science is organized common sense where many a beautiful theory was killed by an ugly fact. *Thomas Henry Huxley* (1825-1895)

Science is simply common sense at its best; that is, rigidly accurate in observation, and merciless to fallacy in logic. *Thomas Henry Huxley* (1825-1895)

Science is the great antidote to the poison of enthusiasm and superstition. *Adam Smith* (1723-1790)

Science is what we understand well enough to explain to a computer. Art is everything else we do. *Donald Ervin Knuth* (1938- )

Science knows no country, because knowledge belongs to humanity, and is the torch which illuminates the world. *Louis Pasteur* (1822-1895)

Science may be described as the art of systematic oversimplification. *Karl Raimund Popper* (1902-1994)

Science not only purifies the religious impulse of the dross of its anthropomorphism but also contributes to a religious spiritualization of our understanding of life. *Albert Einstein* (1879-1955)

Science seems to me to teach in the highest and strongest manner the great truth which is embodied in the Christian conception of entire surrender to the will of God. Sit down before fact as a little child, be prepared to give up every preconceived notion, follow humbly wherever and to whatever abysses nature leads, or you shall learn nothing. I have only begun to learn content and peace of mind since I have resolved at all risks to do this. *Thomas Henry Huxley* (1825-1895)

Science without religion is lame; religion without science is blind. *Albert Einstein* (1879-1955)

Science fiction writers foresee the inevitable, and although problems and catastrophes may be inevitable, solutions are not. *Isaac Asimov* (1920-1992)

Scientific thought is the common heritage of mankind. *Abdus Salam* (1926-1996)

Scientists are not robotic inducing machines that infer structures of explanation only from regularities observed in natural phenomena (assuming, as I doubt, that such a style of reasoning could ever achieve success in principle). Scientists are human beings, immersed in culture, and struggling with all the curious tools of inference that mind permits... Culture can potentiate as well as constrain - as Darwin's translation of Adam Smith's laissez-faire economic models into biology as the theory of natural selection. In any case, objective minds do not exist outside culture, so we must make the best of our ineluctable embedding. *Stephen Jay Gould* (1941-2002)

Scientists are supposed to live in ivory towers. Their darkrooms and their vibration-proof benches are supposed to isolate their activities from the disturbances of common life. What they tell us is supposed to be for the ages, not for the next election. But the reality may be otherwise. *Simon LeVay* (1943- )

Self-education is, I firmly believe, the only kind of education there is. *Isaac Asimov* (1920-1992)

Setting an example is not the main means of influencing another, it is the only means. *Albert Einstein* (1879-1955)

Simplicity is prerequisite for reliability. *Edsger W. Dijkstra* (1930–2002)

Since my logic aims to teach and instruct the understanding, not that it may with the slender tendrils of the mind snatch at and lay hold of abstract notions (as the common logic does), but that it may in very truth dissect nature, and discover the virtues and actions of bodies, with their laws as determined in matter; so that this science flows not merely from the nature of the mind, but also from the nature of things. *Sir Francis Bacon* (1561-1626)

Since religion intrinsically rejects empirical methods, there should never be any attempt to reconcile scientific theories with religion. An infinitely old universe, always evolving may not be compatible with the Book of Genesis. However, religions such as Buddhism get along without having any explicit creation mythology and are in no way contradicted by a universe without a beginning or end. Creatio ex nihilo, even as religious doctrine, only dates to around AD 200. The key is not to confuse myth and empirical results, or religion and science. *Hannes Alfvén* (1908-1995)

Since the mathematicians have invaded the theory of relativity, I do not understand it myself anymore. *Albert Einstein* (1879-1955)

Since we proposed punctuated equilibria to explain trends, it is infuriating to be quoted again and again by creationists - whether through design or stupidity, I do not know - as admitting that the fossil record includes no transitional forms. Transitional forms are generally lacking at the species level, but they are abundant between larger groups. *Stephen Jay Gould* (1941-2002)

Siphonophores do not convey the message - a favorite theme of unthinking romanticism - that nature is but one gigantic whole, all its parts intimately connected and interacting in some higher, ineffable harmony. Nature revels in boundaries and distinctions; we inhabit a universe of structure. But since our universe of structure has evolved historically, it must present us with fuzzy boundaries, where one kind of thing grades into another. *Stephen Jay Gould* (1941-2002)

Sit down before fact as a little child, be prepared to give up every preconceived notion, follow humbly wherever and to whatever abysses nature leads, or you shall learn nothing. *Thomas Henry Huxley* (1825–1895)

So far the theories of mathematics are about reality, they are not certain; so far as they are certain, they are not about reality. *Albert Einstein* (1879-1955)

So many people today - and even professional scientists - seem to me like someone who has seen thousands of trees but has never seen a forest. A knowledge of the historic and philosophical background gives that kind of independence from prejudices of his generation from which most scientists are suffering. This independence created by philosophical insight is - in my opinion -

the mark of distinction between a mere artisan or specialist and a real seeker after truth. *Albert Einstein* (1879-1955)

So why fret and care that the actual version of the destined deed was done by an upper class English gentleman who had circumnavigated the globe as a vigorous youth, lost his dearest daughter and his waning faith at the same time, wrote the greatest treatise ever composed on the taxonomy of barnacles, and eventually grew a white beard, lived as a country squire just south of London, and never again traveled far enough even to cross the English Channel? We care for the same reason that we love okapis, delight in the fossil evidence of trilobites, and mourn the passage of the dodo. We care because the broad events that had to happen, happened to happen in a certain particular way. And something unspeakably holy - I don't know how else to say this - underlies our discovery and confirmation of the actual details that made our world and also, in realms of contingency, assured the minutiae of its construction in the manner we know, and not in any one of a trillion other ways, nearly all of which would not have included the evolution of a scribe to record the beauty, the cruelty, the fascination, and the mystery. *Stephen Jay Gould* (1941-2002)

Sociobiology is not just any statement that biology, genetics, and evolutionary theory have something to do with human behavior. Sociobiology is a specific theory about the nature of genetic and evolutionary input into human behavior. It rests upon the view that natural selection is a virtually omnipotent architect, constructing organisms part by part as best solutions to problems of life in local environments. It fragments organisms into "traits," explains their existence as a set of best solutions, and argues that each trait is a product of natural selection operating "for" the form or behavior in question. Applied to humans, it must view specific behaviors (not just general potentials) as adaptations built by natural selection and rooted in genetic determinants, for natural selection is a theory of genetic change. Thus, we are presented with unproved and unprovable speculations about the adaptive and genetic basis of specific human behaviors: why some (or all) people are aggressive, xenophobic, religious, acquisitive, or homosexual. *Stephen Jay Gould* (1941-2002)

Sociology is the science with the greatest number of methods and the least results. *Jules Henri Poincaré* (1854-1912)

Some look at things that are, and ask why. I dream of things that never were and ask why not? *George Bernard Shaw* (1856-1950)

Some people get an education without going to college; the rest get it after they get out. *Mark Twain* (1835-1910)

Sometimes one pays most for the things one gets for nothing. *Albert Einstein* (1879-1955)

Subtle is the Lord, but malicious He is not. *Albert Einstein* (1879-1955)

Success covers a multitude of blunders. *George Bernard Shaw* (1856-1950)

Suppose that we are wise enough to learn and know - and yet not wise enough to control our learning and knowledge, so that we use it to destroy ourselves? Even if that is so, knowledge remains better than ignorance. *Isaac Asimov* (1920-1992)

Sympathy, therefore, does not arise so much from the view of the passion, as from that of the situation which excites it. We sometimes feel for another, a passion of which he himself seems to be altogether incapable; because, when we put ourselves in his case, that passion arises in our breast from the imagination, though it does not in his from the reality. We blush for the impudence and rudeness of another, though he himself appears to have no sense of the impropriety of his own behaviour. *Adam Smith* (1723-1790)

Taken on the whole, I would believe that Gandhi's views were the most enlightened of all the political men in our time. We should strive to do things in his spirit... not to use violence in fighting for our cause, but by non-participation in what we believe is evil. *Albert Einstein* (1879-1955)

Technological progress is like an axe in the hands of a pathological criminal. *Albert Einstein* (1879-1955)

Tell a man that there are 300 billion stars in the universe, and he'll believe you... Tell him that a bench has wet paint upon it and he'll have to touch it to be sure. Raimond Verwei (*Albert Einstein?*)

That man is an Euclidian point: position without substance. *Ernest Rutherford* (1871-1937)

That which is not measurable is not science. That which is not PHYSICS is stamp collecting. *Ernest Rutherford* (1871-1937)

The advance of science is not comparable to the changes of a city, where old edifices are pitilessly torn down to give place to new, but to the continuous evolution of zoologic types which develop ceaselessly and end by becoming unrecognizable to the common sight, but where an expert eye finds always traces of the prior work of the past centuries. *Jules Henri Poincaré* (1854-1912)

The aid which we feel impelled to give to the helpless is mainly an incidental result of the instinct of sympathy, which was originally acquired as part of the social instincts, but subsequently rendered, in the manner previously indicated, more tender and more widely diffused. Nor could we check our sympathy, even at the urging of hard reason, without deterioration in the noblest part of our nature. *Charles Darwin* (1809-1882)

The aim of poetry is to give a high and voluptuous plausibility to what is palpably not true. I offer the Twenty-third Psalm as an example: "The Lord is my shepherd: I shall not want." It is immensely esteemed by the inmates of almshouses, and by gentlemen waiting to be hanged. I have to limit my own reading of it, avoiding soft and yielding moods, for I too, in my way, am a gentleman waiting to be hanged, as you are. *Henry Louis Mencken* (1880-1956)

The animals of the Burgess Shale are holy objects - in the unconventional sense that this word conveys in some cultures. We do not place them on pedestals and worship from afar. We climb mountains and dynamite hillsides to find them. We quarry them, split them, carve them, draw them, and dissect them, struggling to wrest their secrets. We vilify and curse them for their damnable intransigence. They are grubby little creatures of a sea floor 530 million years old, but we greet them with awe because they are the Old Ones, and they are trying to tell us something. *Stephen Jay Gould* (1941-2002)

The antagonism between science and religion, about which we hear so much, appears to me purely factitious, fabricated on the one hand by short-sighted religious people, who confound theology with religion; and on the other by equally short-sighted scientific people who forget that science takes for its province only that which is susceptible of clear intellectual comprehension. *Thomas Henry Huxley* (1825–1895)

The argument of the "long view" may be correct in some meaninglessly abstract sense, but it represents a fundamental mistake in categories and time scales. Our only legitimate long view extends to our children and our children's children's children - hundreds or a few thousands of years down the road. If we let the slaughter continue, they will share a bleak world with rats, dogs, cockroaches, pigeons, and mosquitoes. A potential recovery millions of years later has no meaning at our appropriate scale. *Stephen Jay Gould* (1941-2002)

The bigotry of the nonbeliever is for me nearly as funny as the bigotry of the believer. *Albert Einstein* (1879-1955)

The cause and root of nearly all evils in the sciences is this - that while we falsely admire and extol the powers of the human mind we neglect to seek for its true helps. *Sir Francis Bacon* (1561-1626)

The chessboard is the world, the pieces are the phenomena of the universe, the rules of the game are what we call the laws of nature. The player on the other side is hidden from us. We know that his play is always fair, just and patient. But we know, to our cost, that he never overlooks a mistake, or makes the slightest allowance for ignorance. *Thomas Henry Huxley*, (1825–1895)

The Christian church, in its attitude toward science, shows the mind of a more or less enlightened man of the Thirteenth Century. It no longer believes that the earth is flat, but it is still convinced that prayer can cure after medicine fails. *Henry Louis Mencken* (1880-1956)

The competent programmer is fully aware of the limited size of his own skull. He therefore approaches his task with full humility, and avoids clever tricks like the plague. *Edsger W. Dijkstra* (1930–2002)

The contingency of history (both for life in general and for the cultures of *Homo sapiens*) and human free will (in the factual rather than theological sense) are conjoined concepts, and no better evidence can be produced than the “experimental” production of markedly different solutions in identical environments. *Stephen Jay Gould* (1941-2002)

The crippling of individuals I consider the worst evil of capitalism. Our whole educational system suffers from this evil. An exaggerated competitive attitude is inculcated into the student, who is trained to worship acquisitive success as a preparation for his future career. *Albert Einstein* (1879-1955)

The cult of individual personalities is always, in my view, unjustified. To be sure, nature distributes her gifts variously among her children. But there are plenty of the well-endowed ones too, thank God, and I am firmly convinced that most of them live quiet, unregarded lives. It strikes me as unfair, and even in bad taste, to select a few of them for boundless admiration, attributing superhuman powers of mind and character to them. This has been my fate, and the contrast between the popular estimate of my powers and achievements and the reality is simply grotesque. The consciousness of this extraordinary state of affairs would be unbearable but for one great consoling thought: it is a welcome symptom in an age which is commonly denounced as materialistic, that it makes heroes of men whose ambitions lie wholly in the intellectual and moral sphere. This proves that knowledge and justice are ranked above wealth and power by a large section of the human race. My experience teaches me that this idealistic outlook is particularly prevalent in America, which is usually decried as a particularly materialistic country. *Albert Einstein* (1879-1955)

The deepest intelligence of philosophy and science are inseparable from a religious view of the world. *Rudjer Boskovic*

The desire for guidance, love, and support prompts men to form the social or moral conception of God. This is the God of Providence, who protects, disposes, rewards, and punishes; the God who, according to the limits of the believer's outlook, loves and cherishes the life of the tribe or of the human race, or even of life itself; the comforter in sorrow and unsatisfied longing; he who preserves the souls of the dead. This is the social or moral conception of God. *Albert Einstein* (1879-1955)

The difference between genius and stupidity is that genius has its limits. *Albert Einstein* (1879-1955)

The difference between myth and science is the difference between divine inspiration of ‘unaided reason’ on the one hand and theories developed in observational contact with the real world on the other. It is the difference between the belief in prophets and critical thinking, between *Credo quia absurdum* (I believe because it is absurd - Tertullian.) and *De omnibus est dubitandum* (Everything should be questioned - Descartes.). To try to write a grand cosmical drama leads necessarily to myth. To try to let knowledge substitute ignorance in increasingly large regions of space and time is science. *Hannes Alfvén* (1908-1995)

The difference between what the most and the least learned people know is inexpressibly trivial in relation to that which is unknown. *Albert Einstein* (1879-1955)

The discovery of natural law is a meeting with God. *F. Dessauer*

The divine tape recorder holds a million scenarios, each perfectly sensible. Little quirks at the outset, occurring for no particular reason, unleash cascades of consequences that make a particular feature seem inevitable in retrospect. But the slightest early nudge contacts a different groove, and history veers into another plausible channel, diverging continually from its original pathway. The end results are so different, the initial perturbation so apparently trivial. *Stephen Jay Gould* (1941-2002)

The economic anarchy of capitalist society as it exists today is, in my opinion, the real source of the evil. We see before us a huge community of producers the members of which are unceasingly striving to deprive each other of the fruits of their collective labor - not by force, but on the whole in faithful compliance with legally established rules. *Albert Einstein* (1879-1955)

The effects of general change in literature are most tellingly recorded not in alteration of the best products, but in the transformation of the most ordinary workaday books; for when potboilers adopt the new style, then the revolution is complete. *Stephen Jay Gould* (1941-2002)

The efforts of most human-beings are consumed in the struggle for their daily bread, but most of those who are, either through fortune or some special gift, relieved of this struggle are largely absorbed in further improving their worldly lot. Beneath the effort directed toward the accumulation of worldly goods lies all too frequently the illusion that this is the most substantial and desirable end to be achieved; but there is, fortunately, a minority composed of those who recognize early in their lives that the most beautiful and satisfying experiences open to humankind are not derived from the outside, but are bound up with the development of the individual's own feeling, thinking and acting. The genuine artists, investigators and thinkers have always been persons of this kind. However inconspicuously the life of these individuals runs its course, none the less the fruits of their endeavors are the most valuable contributions which one generation can make to its successors. *Albert Einstein* (1879-1955)

The enemy is not fundamentalism; it is intolerance. In this case, the intolerance is perverse since it masquerades under the "liberal" rhetoric of "equal time." But mistake it not. *Stephen Jay Gould* (1941-2002)

The energy produced by breaking down the atom is a very poor kind of thing. Anyone who expects a source of power from the transformations of these atoms is taking moonshine. *Ernest Rutherford* (1871-1937)

The English have no respect for their language, and will not teach their children to speak it. It is impossible for an Englishman to open his mouth, without making some other Englishman despise them. *George Bernard Shaw* (1856-1950)

The essence of a genuine professional man is that he cannot be bought. *Henry Louis Mencken* (1880-1956)

The essential unity of ecclesiastical and secular institutions was lost during the 19th century, to the point of senseless hostility. Yet there was never any doubt as to the striving for culture. No one doubted the sacredness of the goal. It was the approach that was disputed. *Albert Einstein* (1879-1955)

The fact that man knows right from wrong proves his intellectual superiority to other creatures; but the fact that he can do wrong proves his moral inferiority to any creature that cannot. *Mark Twain* (1835-1910)

The fact that man produces a concept "I" besides the totality of his mental and emotional experiences or perceptions does not prove that there must be any specific existence behind such a concept. We are succumbing to illusions produced by our self-created language, without reaching a better understanding of anything. Most of so-called philosophy is due to this kind of fallacy. *Albert Einstein* (1879-1955)

The fact that some geniuses were laughed at does not imply that all who are laughed at are geniuses. They laughed at Columbus, they laughed at Fulton, they laughed at the Wright brothers. But they also laughed at Bozo the Clown. *Carl Sagan* (1934-1996)

The facts, gentlemen, and nothing but the facts, for careful eyes are narrowly watching. *Isaac Asimov* (1920-1992)

The facts of nature are what they are, but we can only view them through the spectacles of our mind. Our mind works largely by metaphor and comparison, not always (or often) by relentless logic. When we are caught in conceptual traps, the best exit is often a change in metaphor - not because the new guideline will be truer to nature (for neither the old nor the new metaphor lies

“out there” in the woods), but because we need a shift to more fruitful perspectives, and metaphor is often the best agent of conceptual transition. *Stephen Jay Gould* (1941-2002)

The fairest thing we can experience is the mysterious. It is the fundamental emotion which stands at the cradle of true art and true science. He who knows it not and can no longer wonder, no longer feel amazement, is as good as dead, a snuffed-out candle. It was the experience of mystery - even if mixed with fear - that engendered religion. A knowledge of the existence of something we cannot penetrate, of the manifestations of the profoundest reason and the most radiant beauty, which are only accessible to our reason in their most elementary forms - it is this knowledge and this emotion that constitute the truly religious attitude; in this sense, and in this alone, I am a deeply religious man. *Albert Einstein* (1879-1955)

The finest emotion of which we are capable is the mystic emotion. Herein lies the germ of all art and all true science. Anyone to whom this feeling is alien, who is no longer capable of wonderment and lives in a state of fear is a dead man. To know that what is impenetrable for us really exists and manifests itself as the highest wisdom and the most radiant beauty, whose gross forms alone are intelligible to our poor faculties - this knowledge, this feeling ... that is the core of the true religious sentiment. In this sense, and in this sense alone, I rank myself among profoundly religious men. *Albert Einstein* (1879-1955)

The first principle is that you must not fool yourself - and you are the easiest person to fool. *Richard Phillips Feynman* (1918-1988)

The further the spiritual evolution of mankind advances, the more certain it seems to me that the path to genuine religiosity does not lie through the fear of life, and the fear of death, and blind faith, but through striving after rational knowledge. *Albert Einstein* (1879-1955)

The general root of superstition is that men observe when things hit, and not when they miss, and commit to memory the one, and pass over the other. *Sir Francis Bacon* (1561-1626)

The golden rule is that there are no golden rules. *George Bernard Shaw* (1856-1950)

The grand aim of all science is to cover the greatest number of empirical facts by logical deduction from the smallest number of hypotheses or axioms. *Albert Einstein* (1879-1955)

The great end of life is not knowledge, but action. What men need is as much knowledge as they can organize for action; give them more and it may become injurious. Some men are heavy and stupid from undigested learning. *Thomas Henry Huxley* (1825-1895)

The great moral teachers of humanity were, in a way, artistic geniuses in the art of living. *Albert Einstein* (1879-1955)

The great tragedy of science - the slaying of a beautiful hypothesis by an ugly fact. *Thomas Henry Huxley* (1825-1895)

The greatest error of all the rest is the mistaking or misplacing of the last or farthest end of knowledge: for men have entered into a desire of learning and knowledge, sometimes upon a natural curiosity and inquisitive appetite; sometimes to entertain their minds with variety and delight; sometimes for ornament and reputation; and sometimes to enable them to victory of wit and contradiction; and most times for lucre and profession; and seldom sincerely to give a true account of their gift of reason, to the benefit and use of men. *Sir Francis Bacon* (1561-1626)

The greatest problem of communication is the illusion that it has been achieved. *George Bernard Shaw* (1856-1950)

The hardest thing to understand in the world is the income tax. *Albert Einstein* (1879-1955)

The hardest thing to understand is why we can understand anything at all. *Albert Einstein* (1879-1955)

The health of society thus depends quite as much on the independence of the individuals composing it as on their close political cohesion. *Albert Einstein* (1879-1955)

The highest principles for our aspirations and judgments are given to us in the Jewish-Christian religious tradition. It is a very high goal which, with our weak powers, we can reach only very

inadequately, but which gives a sure foundation to our aspirations and valuations. *Albert Einstein* (1879-1955)

The history of a species, or any natural phenomenon that requires unbroken continuity in a world of trouble, works like a batting streak. All are games of a gambler playing with a limited stake against a house with infinite resources. The gambler must eventually go bust. His aim can only be to stick around as long as possible, to have some fun while he's at it, and, if he happens to be a moral agent as well, to worry about staying the course with honor. *Stephen Jay Gould* (1941-2002)

The history of most fossil species includes two features particularly inconsistent with gradualism: 1. Stasis. Most species exhibit no directional change during their tenure on earth. They appear in the fossil record looking much the same as when they disappear; morphological change is usually limited and directionless. 2. Sudden appearance. In any local area, a species does not arise gradually by the steady transformation of its ancestors; it appears all at once and "fully formed." *Stephen Jay Gould* (1941-2002)

The human brain became large by natural selection (who knows why, but presumably for good cause). Yet surely most "things" now done by our brains, and essential both to our cultures and to our very survival, are epiphenomena of the computing power of this machine, not genetically grounded Darwinian entities created specifically by natural selection for their current function. *Stephen Jay Gould* (1941-2002)

The human mind delights in finding pattern - so much so that we often mistake coincidence or forced analogy for profound meaning. No other habit of thought lies so deeply within the soul of a small creature trying to make sense of a complex world not constructed for it. *Stephen Jay Gould* (1941-2002)

The human understanding is moved by those things most which strike and enter the mind simultaneously and suddenly, and so fill the imagination; and then it feigns and supposes all other things to be somehow, though it cannot see how, similar to those few things by which it is surrounded. *Sir Francis Bacon* (1561-1626)

The human understanding is of its own nature prone to suppose the existence of more order and regularity in the world than it finds. And though there be many things in nature which are singular and unmatched, yet it devises for them parallels and conjugates and relatives which do not exist. Hence the fiction that all celestial bodies move in perfect circles, spirals and dragons being (except in name) utterly rejected. *Sir Francis Bacon* (1561-1626)

The human understanding is unquiet; it cannot stop or rest, and still presses onward, but in vain. Therefore it is that we cannot conceive of any end or limit to the world, but always as of necessity it occurs to us that there is something beyond... But he is no less an unskilled and shallow philosopher who seeks causes of that which is most general, than he who in things subordinate and subaltern omits to do so. *Sir Francis Bacon* (1561-1626)

The human understanding when it has once adopted an opinion (either as being the received opinion or as being agreeable to itself) draws all things else to support and agree with it. And though there be a greater number and weight of instances to be found on the other side, yet these it either neglects and despises, or else by some distinction sets aside and rejects, in order that by this great and pernicious predetermination the authority of its former conclusions may remain inviolate. *Sir Francis Bacon* (1561-1626)

The idea of achieving security through national armament is, at the present state of military technique, a disastrous illusion. *Albert Einstein* (1879-1955)

The ideal government of all reflective men, from Aristotle onward, is one which lets the individual alone - one which barely escapes being no government at all. This ideal, I believe, will be realized in the world twenty or thirty centuries after I have passed from these scenes and taken up my public duties in Hell. *Henry Louis Mencken* (1880-1956)



The important thing is not to stop questioning. Curiosity has its own reason for existing. One cannot help but be in awe when he contemplates the mysteries of eternity, of life, of the marvelous structure of reality. *Albert Einstein* (1879-1955)

The individual feels the futility of human desires and aims and the sublimity and marvelous order which reveal themselves both in nature and in the world of thought. Individual existence impresses him as a sort of prison and he wants to experience the universe as a single significant whole. The beginnings of cosmic religious feeling already appear at an early stage of development, e.g., in many of the Psalms of David and in some of the Prophets. Buddhism, as we have learned especially from the wonderful writings of Schopenhauer, contains a much stronger element of this. The religious geniuses of all ages have been distinguished by this kind of religious feeling, which knows no dogma and no God conceived in man's image; so that there can be no church whose central teachings are based on it. Hence it is precisely among the heretics of every age that we find men who were filled with this highest kind of religious feeling and were in many cases regarded by their contemporaries as atheists, sometimes also as saints. Looked at in this light, men like Democritus, Francis of Assisi, and Spinoza are closely akin to one another. *Albert Einstein* (1879-1955)

The individual, if left alone from birth would remain primitive and beast-like in his thoughts and feelings to a degree that we can hardly conceive. The individual is what he is and has the significance that he has not so much in virtue of his individuality, but rather as a member of a great human society, which directs his material and spiritual existence from the cradle to the grave. *Albert Einstein* (1879-1955)

The Jewish scriptures admirably illustrate the development from the religion of fear to moral religion, a development continued in the New Testament. The religions of all civilized peoples, especially the peoples of the Orient, are primarily moral religions. The development from a religion of fear to moral religion is a great step in peoples' lives. And yet, that primitive religions are based entirely on fear and the religions of civilized peoples purely on morality is a prejudice against which we must be on our guard. The truth is that all religions are a varying blend of both types, with this differentiation: that on the higher levels of social life the religion of morality predominates. *Albert Einstein* (1879-1955)

The Law of conservation of energy tells us we can't get something for nothing, but we refuse to believe it. *Isaac Asimov* (1920-1992)

The laws of physics and chemistry are statistical throughout. *Erwin Schrödinger* (1887-1961)

The legends of fieldwork locate all important sites deep in inaccessible jungles inhabited by fierce beasts and restless natives, and surrounded by miasmas of putrefaction and swarms of tsetse flies. (Alternative models include the hundredth dune after the death of all camels, or the thousandth crevasse following the demise of all sled dogs.) *Stephen Jay Gould* (1941-2002)

The logic now in use serves rather to fix and give stability to the errors which have their foundation in commonly received notions than to help the search for truth. So it does more harm than good. *Sir Francis Bacon* (1561-1626)

The main source of the present-day conflicts between the spheres of religion and of science lies in this concept of a personal God. *Albert Einstein* (1879-1955)

The man who is thoroughly convinced of the universal operation of the law of causation cannot for a moment entertain the idea of a being who interferes in the course of events - provided, of course, that he takes the hypothesis of causality really seriously. He has no use for the religion of fear and equally little for social or moral religion. A God who rewards and punishes is inconceivable to him for the simple reason that a man's actions are determined by necessity, external and internal, so that in God's eyes he cannot be responsible, any more than an inanimate object is responsible for the motions it undergoes. Science has therefore been charged with undermining morality, but the charge is unjust. A man's ethical behavior should be based effectually on sympathy, education, and social ties and needs; no religious basis is necessary.

Man would indeed be in a poor way if he had to be restrained by fear of punishment and hopes of reward after death. *Albert Einstein* (1879-1955)

The mass of a body is a measure of its energy content. *Albert Einstein* (1879-1955)

The material world has only been constructed at the price of taking the self, that is, mind, out of it, removing it; mind is not part of it. *Erwin Schrödinger* (1887-1961)

The monuments of wit survive the monuments of power. *Sir Francis Bacon* (1561-1626)

The moral attitudes of a people that is supported by religion need always aim at preserving and promoting the sanity and vitality of the community and its individuals, since otherwise this community is bound to perish. A people that were to honor falsehood, defamation, fraud, and murder would be unable, indeed, to subsist for very long. *Albert Einstein* (1879-1955)

The moral faculties are generally and justly esteemed as of higher value than the intellectual powers. But we should bear in mind that the activity of the mind in vividly recalling past impressions is one of the fundamental though secondary bases of conscience. This affords the strongest argument for educating and stimulating in all possible ways the intellectual faculties of every human being. *Charles Darwin* (1809-1882)

The more a man is imbued with the ordered regularity of all events the firmer becomes his conviction that there is no room left by the side of this ordered regularity for causes of a different nature. For him neither the rule of human nor the rule of divine will exists as an independent cause of natural events. To be sure, the doctrine of a personal God interfering with natural events could never be refuted, in the real sense, by science, for this doctrine can always take refuge in those domains in which scientific knowledge has not yet been able to set foot. *Albert Einstein* (1879-1955)

The more efficient causes of progress seem to consist of a good education during youth whilst the brain is impressible, and of a high standard of excellence, inculcated by the ablest and best men, embodied in the laws, customs and traditions of the nation, and enforced by public opinion. It should, however, be borne in mind, that the enforcement of public opinion depends on our appreciation of the approbation and disapprobation of others; and this appreciation is founded on our sympathy, which it can hardly be doubted was originally developed through natural selection as one of the most important elements of the social instincts. *Charles Darwin* (1809-1882)

The more physics you have the less engineering you need. *Ernest Rutherford* (1871-1937)

The more we know of things, the more we know of God. *Baruch Spinoza* (1632-1677)

The most beautiful and deepest experience a man can have is the sense of the mysterious. It is the underlying principle of religion as well as all serious endeavour in art and science. He who never had this experience seems to me, if not dead, then at least blind. To sense that behind anything that can be experienced there is a something that our mind cannot grasp and whose beauty and sublimity reaches us only indirectly and as a feeble reflection, this is religiousness. *Albert Einstein* (1879-1955)

The most beautiful emotion we can experience is the mystical. It is the sower of all true art and science. He to whom this emotion is a stranger... is as good as dead. *Albert Einstein* (1879-1955)

The most beautiful experience we can have is the mysterious. It is the fundamental emotion that stands at the cradle of true art and true science. Whoever does not know it and can no longer wonder, no longer marvel, is as good as dead, and his eyes are dimmed. It was the experience of mystery - even if mixed with fear - that engendered religion. A knowledge of the existence of something we cannot penetrate, our perceptions of the profoundest reason and the most radiant beauty, which only in their most primitive forms are accessible to our minds: it is this knowledge and this emotion that constitute true religiosity. In this sense, and only this sense, I am a deeply religious man. *Albert Einstein* (1879-1955)

The most beautiful experience we can have is the mysterious - the fundamental emotion which stands at the cradle of true art and true science. *Albert Einstein* (1879-1955)

The most beautiful thing we can experience is the mysterious. It is the source of all true art and all science. He to whom this emotion is a stranger, who can no longer pause to wonder and stand rapt in awe, is as good as dead: his eyes are closed. *Albert Einstein* (1879-1955)

The most dangerous man, to any government, is the man who is able to think things out for himself, without regard to the prevailing superstitions and taboos. Almost inevitably he comes to the conclusion that the government he lives under is dishonest, insane and intolerable, and so, if he is romantic, he tries to change it. And even if he is not romantic personally he is very apt to spread discontent among those who are. *Henry Louis Mencken* (1880-1956)

The most exciting phrase to hear in science, the one that heralds new discoveries, is not 'Eureka!', but 'That's funny ...' *Isaac Asimov* (1920-1992)

The most hopelessly stupid man is he who is not aware that he is wise. *Isaac Asimov* (1920-1992)

The most important discoveries will provide answers to questions that we do not yet know how to ask and will concern objects we have not yet imagined. *John N. Bahcall*

The most important human endeavor is the striving for morality in our actions. Our inner balance and even our very existence depend on it. Only morality in our actions can give beauty and dignity to life. *Albert Einstein* (1879-1955)

The most incomprehensible thing about the world is that it is at all comprehensible. *Albert Einstein* (1879-1955)

The most incomprehensible thing about the world is that it is comprehensible. *Albert Einstein* (1879-1955)

The most powerful force in the universe is compound interest. *Albert Einstein* (1879-1955)

The multiplicity is only apparent. This is the doctrine of the Upanishads. And not of the Upanishads only. The mystical experience of the union with God regularly leads to this view, unless strong prejudices stand in the West. *Erwin Schrödinger* (1887-1961)

The observing mind is not a physical system, it cannot interact with any physical system. And it might be better to reserve the term "subject" for the observing mind... For the subject, if anything, is the thing that senses and thinks. Sensations and thoughts do not belong to the "world of energy." *Erwin Schrödinger* (1887-1961)

The one lesson that comes out of all our theorizing and experimenting is that there is only one really scientific progressive method; and that is the method of trial and error. *George Bernard Shaw* (1856-1950)

The only man who behaved sensibly was my tailor; he took my measurement anew every time he saw me, while all the rest went on with their old measurements and expected them to fit me. *George Bernard Shaw* (1856-1950)

The only possible interpretation of any research whatever in the 'social sciences' is: some do, some don't. *Ernest Rutherford* (1871-1937)

The only real valuable thing is intuition. The intellect has little to do on the road to discovery. *Albert Einstein* (1879-1955)

The oppressive weight of disaster and tragedy in our lives does not arise from a high percentage of evil among the summed total of all acts, but from the extraordinary power of exceedingly rare incidents of depravity to inflict catastrophic damage, especially in our technological age when airplanes can become powerful bombs. (An even more evil man, armed only with a longbow, could not have wreaked such havoc at the Battle of Agincourt in 1415.) *Stephen Jay Gould* (1941-2002)

The order, the symmetry, the harmony enchant us...God is pure order. He is the originator of universal harmony. *Gottfried Wilhelm von Leibniz* (1646-1716)

The owner of the means of production is in a position to purchase the labor power of the worker. By using the means of production, the worker produces new goods which become the property of

the capitalist. The essential point about this process is the relation between what the worker produces and what he is paid, both measured in terms of real value. In so far as the labor contract is free what the worker receives is determined not by the real value of the goods he produces, but by his minimum needs and by the capitalists' requirements for labor power in relation to the number of workers competing for jobs. It is important to understand that even in theory the payment of the worker is not determined by the value of his product. *Albert Einstein* (1879-1955)

The physicists say that I am a mathematician, and the mathematicians say that I am a physicist. I am a completely isolated man and though everybody knows me, there are very few people who really know me. *Albert Einstein* (1879-1955)

The plain fact is that education is itself a form of propaganda - a deliberate scheme to outfit the pupil, not with the capacity to weigh ideas, but with a simple appetite for gulping ideas ready-made. The aim is to make 'good' citizens, which is to say, docile and uninquisitive citizens. *Henry Louis Mencken* (1880-1956)

The plurality that we perceive is only an appearance; it is not real. *Erwin Schrödinger* (1887-1961)

The position in which we are now is a very strange one which in general political life never happened. Namely, the thing that I refer to is this: To have security against atomic bombs and against the other biological weapons, we have to prevent war, for if we cannot prevent war every nation will use every means that is at their disposal; and in spite of all promises they make, they will do it. *Albert Einstein* (1879-1955)

The power of accurate observation is commonly called cynicism by those who have not got it. *George Bernard Shaw* (1856-1950)

The prestige of government has undoubtedly been lowered considerably by the prohibition law. For nothing is more destructive of respect for the government and the law of the land than passing laws which cannot be enforced. It is an open secret that the dangerous increase of crime in the United States is closely connected with this. *Albert Einstein* (1879-1955)

The prisoner falls in love with his chains. *Edsger W. Dijkstra* (1930-2002)

The progress of science requires more than new data; it needs novel frameworks and contexts. And where do these fundamentally new views of the world arise? They are not simply discovered by pure observation; they require new modes of thought. And where can we find them, if old modes do not even include the right metaphors? The nature of true genius must lie in the elusive capacity to construct these new modes from apparent darkness. The basic chanciness and unpredictability of science must also reside in the inherent difficulty of such a task. *Stephen Jay Gould* (1941-2002)

The pursuit of truth and beauty is a sphere of activity in which we are permitted to remain children all our lives. *Albert Einstein* (1879-1955)

The question of whether Machines Can Think... is about as relevant as the question of whether Submarines Can Swim. *Edsger W. Dijkstra* (1930-2002)

The real tragedy of human existence is not that we are nasty by nature, but that a cruel structural asymmetry grants to rare events of meanness such power to shape our history. *Stephen Jay Gould* (1941-2002)

The really valuable thing in the pageant of human life seems to me not the State but the creative, sentient individual, the personality; it alone creates the noble and the sublime, while the herd as such remains dull in thought and dull in feeling. *Albert Einstein* (1879-1955)

The reciprocal relationship of epistemology and science is of noteworthy kind. They are dependent on each other. Epistemology without contact with science becomes an empty scheme. Science without epistemology is - insofar as it is thinkable at all - primitive and muddled. *Albert Einstein* (1879-1955)

The release of atomic power has changed everything except our way of thinking... the solution to this problem lies in the heart of mankind. If only I had known, I should have become a watchmaker. *Albert Einstein* (1879-1955)

The required techniques of effective reasoning are pretty formal, but as long as programming is done by people that don't master them, the software crisis will remain with us and will be considered an incurable disease. And you know what incurable diseases do: they invite the quacks and charlatans in, who in this case take the form of Software Engineering gurus. *Edsger W. Dijkstra* (1930–2002)

The saddest aspect of life right now is that science gathers knowledge faster than society gathers wisdom. *Isaac Asimov* (1920-1992)

The science of Psychiatry is now where the science of Medicine was before germs were discovered. *Malcolm Rogers*

The Scientific Revolution turns us away from the older sayings to discover the lost authorization in Nature. What we have been through in these last four millennia is the slow inexorable profaning of our species. And in the last part of the second millenium A.D., that process is apparently becoming complete. It is the Great Human Irony of our noblest and greatest endeavor on this planet that in the quest for authorization, in our reading of the language of God in Nature, we should read there so clearly that we have been so mistaken. *Julian Jaynes*

The scientific world-picture vouchsafes a very complete understanding of all that happens - it makes it just a little too understandable. It allows you to imagine the total display as that of a mechanical clockwork which, for all that science knows, could go on just the same as it does, without there being consciousness, will, endeavor, pain and delight and responsibility connected with it - though they actually are. And the reason for this disconcerting situation is just this: that for the purpose of constructing the picture of the external world, we have used the greatly simplifying device of cutting our own personality out, removing it; hence it is gone, it has evaporated, it is ostensibly not needed. *Erwin Schrödinger* (1887-1961)

The scientist does not study nature because it is useful to do so. He studies it because he takes pleasure in it, and he takes pleasure in it because it is beautiful. If nature were not beautiful it would not be worth knowing, and life would not be worth living. I am not speaking, of course, of the beauty which strikes the senses, of the beauty of qualities and appearances. I am far from despising this, but it has nothing to do with science. What I mean is that more intimate beauty which comes from the harmonious order of its parts, and which a pure intelligence can grasp. *Jules Henri Poincaré* (1854-1912)

The search for truth is more precious than its possession. *Albert Einstein* (1879-1955)

The secret to creativity is knowing how to hide your sources. *Albert Einstein* (1879-1955)

The sensation of colour cannot be accounted for by the physicist's objective picture of light-waves. *Erwin Schrödinger* (1887-1961)

The significant problems we face cannot be solved by the same level of thinking that created them. *Albert Einstein* (1879-1955)

The silliest and most tendentious of baseball writing tries to wrest profundity from the spectacle of grown men hitting a ball with a stick by suggesting linkages between the sport and deep issues of morality, parenthood, history, lost innocence, gentleness, and so on, seemingly ad infinitum. (The effort reeks of silliness because baseball is profound all by itself and needs no excuses; people who don't know this are not fans and are therefore unreachable anyway.) *Stephen Jay Gould* (1941-2002)

The skein of human continuity must often become this tenuous across the centuries (hanging by a thread, in the old cliché), but the circle remains unbroken if I can touch the ink of Lavoisier's own name, written by his own hand. A candle of light, nurtured by the oxygen of his greatest discovery, never burns out if we cherish the intellectual heritage of such unfractured filiation across the ages. We may also wish to contemplate the genuine physical thread of nucleic acid

that ties each of us to the common bacterial ancestor of all living creatures, born on Lavoisier's ancienne terre more than 3.5 billion years ago - and never since disrupted, not for one moment, not for one generation. Such a legacy must be worth preserving from all the guillotines of our folly. *Stephen Jay Gould* (1941-2002)

The slowest goat sees the last sunset last. *Charles Darwin* (1809-1882)

The so-called Marxian dialectic is simply an effort by third-rate men to give an air of profundity to balderdash. Christianity has gone the same way. There are some sound ideas in it, but its advocates always add a lot of preposterous nonsense. The result is theology. *Henry Louis Mencken* (1880-1956)

The solution, as all thoughtful people recognize, must lie in properly melding the themes of inborn predisposition and shaping through life's experiences. This fruitful joining cannot take the false form of percentages adding to 100 - as in "intelligence is 80 percent nature and 20 percent nurture," or "homosexuality is 50 percent inborn and 50 percent learned," and a hundred other harmful statements in this foolish format. When two ends of such a spectrum are commingled, the result is not a separable amalgam (like shuffling two decks of cards with different backs), but an entirely new and higher entity that cannot be decomposed (just as adults cannot be separated into maternal and paternal contributions to their totality). *Stephen Jay Gould* (1941-2002)

The stakes are immense, the task colossal, the time is short. But we may hope - we must hope - that man's own creation, man's own genius, will not destroy him. Scholars, indeed all men, must move forward in the faith of that philosopher who held that there is no problem the human reason can propound which the human reason cannot reason out. *Albert Einstein* (1879-1955)

The state is made for man, not man for the state. And in this respect science resembles the state. *Albert Einstein* (1879-1955)

The state of mind which enables a man to do work of this kind is akin to that of the religious worshiper or the lover; the daily effort comes from no deliberate intention or program, but straight from the heart. *Albert Einstein* (1879-1955)

The story of a theory's failure often strikes readers as sad and unsatisfying. Since science thrives on self-correction, we who practice this most challenging of human arts do not share such a feeling. We may be unhappy if a favored hypothesis loses or chagrined if theories that we proposed prove inadequate. But refutation almost always contains positive lessons that overwhelm disappointment, even when no new and comprehensive theory has yet filled the void. *Stephen Jay Gould* (1941-2002)

The Sun is at the center of the Universe. *Copernicus* (1473-1543)

The supreme goal of all theory is to make the irreducible basic elements as simple and as few as possible without having to surrender the adequate representation of a single datum of experience. *Albert Einstein* (1879-1955)

The supreme task of the physicist is to arrive at those universal elementary laws from which the cosmos can be built up by pure deduction. There is no logical path to these laws; only intuition, resting on sympathetic understanding of experience, can reach them. In this methodological uncertainty, one might suppose that there were any number of possible systems of theoretical physics all equally well justified; and this opinion is no doubt correct, theoretically. But the development of physics has shown that at any given moment, out of all conceivable constructions, a single one has always proved itself decidedly superior to all the rest. *Albert Einstein* (1879-1955)

The surgeon may harden himself whilst performing an operation, for he knows that he is acting for the good of his patient; but if we were intentionally to neglect the weak and helpless, it could only be for a contingent benefit, with an overwhelming present evil. *Charles Darwin* (1809-1882)

The theory of punctuated equilibrium, proposed by Niles Eldredge and myself, is not, as so often misunderstood, a radical claim for truly sudden change, but a recognition that ordinary processes of speciation, properly conceived as glacially slow by the standard of our own life-span, do not resolve into geological time as long sequences of insensibly graded intermediates (the traditional, or gradualistic, view), but as geologically “sudden” origins at single bedding planes. *Stephen Jay Gould* (1941-2002)

The true beauty of nature is her amplitude; she exists neither for nor because of us, and possesses a staying power that all our nuclear arsenals cannot threaten (much as we can easily destroy our puny selves). *Stephen Jay Gould* (1941-2002)

The true delight is in the finding out rather than in the knowing. *Isaac Asimov* (1920-1992)

The true value of a human being is determined primarily by the measure and the sense in which he has attained to liberation from the self. *Albert Einstein* (1879-1955)

The truly awesome intellectuals in our history have not merely made discoveries; they have woven variegated, but firm, tapestries of comprehensive coverage. The tapestries have various fates: Most burn or unravel in the footsteps of time and the fires of later discovery. But their glory lies in their integrity as unified structures of great complexity and broad implication. *Stephen Jay Gould* (1941-2002)

The United States is the most powerful technically advanced country in the world to-day. Its influence on the shaping of international relations is absolutely incalculable. But America is a large country and its people have so far not shown much interest in great international problems, among which the problem of disarmament occupies first place today. This must be changed, if only in the essential interests of the Americans. The last war has shown that there are no longer any barriers between the continents and that the destinies of all countries are closely interwoven. The people of this country must realize that they have a great responsibility in the sphere of international politics. The part of passive spectator is unworthy of this country and is bound in the end to lead to disaster all round. *Albert Einstein* (1879-1955)

The unleashed power of the atom has changed everything save our modes of thinking and we thus drift toward unparalleled catastrophe. *Albert Einstein* (1879-1955)

The use of COBOL cripples the mind; its teaching should, therefore, be regarded as a criminal offence. *Edsger W. Dijkstra* (1930–2002)

The vigorous branching of life's tree, and not the accumulating valor of mythical marches to progress, lies behind the persistence and expansion of organic diversity in our tough and constantly stressful world. And if we do not grasp the fundamental nature of branching as the key to life's passage across the geological stage, we will never understand evolution aright. *Stephen Jay Gould* (1941-2002)

The whole of science is nothing more than a refinement of everyday thinking. *Albert Einstein* (1879-1955)

The wonderful arrangement and harmony of the cosmos would only originate in the plan of an almighty omniscient being. This is and remains my greatest comprehension. *Sir Isaac Newton* (1643-1727)

The world always makes the assumption that the exposure of an error is identical with the discovery of truth that the error and truth are simply opposite. They are nothing of the sort. What the world turns to, when it is cured on one error, is usually simply another error, and maybe one worse than the first one. *Henry Louis Mencken* (1880-1956)

The world is a dangerous place to live, not because of the people who are evil, but because of the people who don't do anything about it. *Albert Einstein* (1879-1955)

The world is full of signals that we don't perceive. Tiny creatures live in a different world of unfamiliar forces. Many animals of our scale greatly exceed our range of perception for sensations familiar to us... What an imperceptive lot we are. Surrounded by so much, so fascinating and so real, that we do not see (hear, smell, touch, taste) in nature, yet so gullible

and so seduced by claims for novel power that we mistake the tricks of mediocre magicians for glimpses of a psychic world beyond our ken. The paranormal may be a fantasy; it is certainly a haven for charlatans. But “parahuman” powers of perception lie all about us in birds, bees, and bacteria. *Stephen Jay Gould* (1941-2002)

The world is given to me only once, not one existing and one perceived. Subject and object are only one. The barrier between them cannot be said to have broken down as a result of recent experience in the physical sciences, for this barrier does not exist. *Erwin Schrödinger* (1887-1961)

The world makes up for all its follies and injustices by being damnably sentimental. *Thomas Henry Huxley* (1825–1895)

The world, unfortunately, rarely matches our hopes and consistently refuses to behave in a reasonable manner. *Stephen Jay Gould* (1941-2002)

Theories rarely arise as patient inferences forced by accumulated facts. Theories are mental constructs potentiated by complex external prods (including, in idealized cases, a commanding push from empirical reality). But the prods often include dreams, quirks, and errors - just as we may obtain crucial bursts of energy from foodstuffs or pharmaceuticals of no objective or enduring value. Great truth can emerge from small error. Evolution is thrilling, liberating, and correct. And *Macrauchenia* is a litoptern. *Stephen Jay Gould* (1941-2002)

There are and can be only two ways of searching into and discovering truth. The one flies from the senses and particulars to the most general axioms, and from these principles, the truth of which it takes for settled and immovable, proceeds to judgment and to the discovery of middle axioms. And this way is now in fashion. The other derives axioms from the senses and particulars, rising by a gradual and unbroken ascent, so that it arrives at the most general axioms last of all. This is the true way, but as yet untried. *Sir Francis Bacon* (1561-1626)

There are children playing in the street who could solve some of my top problems in physics, because they have modes of sensory perception that I lost long ago. *Julius Robert Oppenheimer* (1904-1967)

There are few enough people with sufficient independence to see the weaknesses and follies of their contemporaries and remain themselves untouched by them. And these isolated few usually soon lose their zeal for putting things to rights when they have come face to face with human obduracy. Only to a tiny minority is it given to fascinate their generation by subtle humour and grace and to hold the mirror up to it by the impersonal agency of art. To-day I salute with sincere emotion the supreme master of this method, who has delighted - and educated - us all. *Albert Einstein* (1875-1955)

There are four classes of Idols which beset men's minds. To these for distinction's sake I have assigned names - calling the first class, Idols of the Tribe ; the second, Idols of the Cave; the third, Idols of the Market-Place; the fourth, Idols of the Theater. *Sir Francis Bacon* (1561-1626)

There are lies, damned lies, and statistics. *Mark Twain* (1835-1910)

There are many different styles of composition. I characterize them always as Mozart versus Beethoven. When Mozart began to write at that time he had the composition ready in his mind. He wrote the manuscript and it was 'aus einem Guss' (casted as one). And it was also written very beautiful. Beethoven was an indecisive and a tinkerer and wrote down before he had the composition ready and plastered parts over to change them. There was a certain place where he plastered over nine times and one did remove that carefully to see what happened and it turned out the last version was the same as the first one. *Edsger W. Dijkstra* (1930–2002)

There are no shortcuts to moral insight. Nature is not intrinsically anything that can offer comfort or solace in human terms - if only because our species is such an insignificant latecomer in a world not constructed for us. So much the better. The answers to moral dilemmas are not lying out there, waiting to be discovered. They reside, like the kingdom of God, within us - the most difficult and inaccessible spot for any discovery or consensus. *Stephen Jay Gould* (1941-2002)



There are no such things as applied sciences, only applications of science. *Louis Pasteur* (1822-1895)

There are only two ways to live your life. One is as though nothing is a miracle. The other is as though everything is a miracle. *Albert Einstein* (1875-1955)

There are pessimists who hold that such a state of affairs is necessarily inherent in human nature; it is those who propound such views that are the enemies of true religion, for they imply thereby that religious teachings are utopian ideals and unsuited to afford guidance in human affairs. The study of the social patterns in certain so-called primitive cultures, however, seems to have made it sufficiently evident that such a defeatist view is wholly unwarranted. *Albert Einstein* (1875-1955)

There are some people who read too much: The bibliobibuli. I know some who are constantly drunk on books, as others are drunk on whiskey or religion. They wander through this most diverting and stimulating of worlds in a haze, seeing nothing and hearing nothing. *Henry Louis Mencken* (1880-1956)

There are three side effects of acid. Enhanced long term memory, decreased short term memory, and I forgot the third. *Timothy Francis Leary* (1920-1996)

There are two times in a man's life when he should not speculate: when he can't afford it, and when he can. *Mark Twain* (1835-1910)

There is a single light of science, and to brighten it anywhere is to brighten it everywhere. *Isaac Asimov* (1920-1992)

There is another ground of hope that must not be omitted. Let men but think over their infinite expenditure of understanding, time, and means on matters and pursuits of far less use and value; whereof, if but a small part were directed to sound and solid studies, there is no difficulty that might not be overcome. *Sir Francis Bacon* (1561-1626)

There is grandeur in this view of life, with its several powers, having been originally breathed into a few forms or into one; and that, whilst this planet has gone cycling on according to the fixed law of gravity, from so simple a beginning endless forms most beautiful and most wonderful have been, and are being, evolved. *Charles Darwin* (1809-1882)

There is no belief, however foolish, that will not gather its faithful adherents who will defend it to the death. *Isaac Asimov* (1920-1992)

There is no fundamental difference between man and the higher animals in their mental faculties... The lower animals, like man, manifestly feel pleasure and pain, happiness, and misery. *Charles Darwin* (1809-1882)

There is no gene "for" such unambiguous bits of morphology as your left kneecap or your fingernail... Hundreds of genes contribute to the building of most body parts and their action is channeled through a kaleidoscopic series of environmental influences: embryonic and postnatal, internal and external. Parts are not translated genes, and selection doesn't even work directly on parts. *Stephen Jay Gould* (1941-2002)

There is no love sincerer than the love of food. *George Bernard Shaw* (1856-1950)

There is no vice that doth so cover a man with shame as to be found false and perfidious. *Sir Francis Bacon* (1561-1626)

There is not the slightest indication that nuclear energy will ever be obtainable. It would mean that the atom would have to be shattered at will. *Albert Einstein* (1875-1955)

There is nothing frightening about an eternal dreamless sleep. Surely it is better than eternal torment in Hell and eternal boredom in Heaven. *Isaac Asimov* (1920-1992)

There is obviously only one alternative, namely the unification of minds or consciousnesses. Their multiplicity is only apparent, in truth there is only one mind. *Erwin Schrödinger* (1887-1961)

There is something fascinating about science. One gets such wholesome returns of conjecture out of such a trifling investment of fact. *Mark Twain* (1835-1910)

There must be no barriers for freedom of inquiry. There is no place for dogma in science. The scientist is free, and must be free to ask any question, to doubt any assertion, to seek for any evidence, to correct any errors. *Julius Robert Oppenheimer* (1904-1967)

There remains something subtle, intangible and inexplicable. Veneration for this force beyond anything that we can comprehend is my religion. *Albert Einstein* (1875-1955)

There was this huge world out there, independent of us human beings and standing before us like a great, eternal riddle, at least partly accessible to our inspection and thought. The contemplation of that world beckoned like a liberation. *Albert Einstein* (1875-1955)

There's something about a pious man such as he. He will cheerfully cut your throat if it suits him, but he will hesitate to endanger the welfare of your immaterial and problematical soul. *Isaac Asimov* (1920-1992)

Therefore it is by no means an idle game if we become practiced in analysing long-held commonplace concepts and showing the circumstances on which their justification and usefulness depend, and how they have grown up, individually, out of the givens of experience. Thus their excessive authority will be broken. *Albert Einstein* (1875-1955)

They are ill discoverers that think there is no land, when they can see nothing but sea. *Sir Francis Bacon* (1561-1626)

Things should be as simple as possible, but not simpler. *Albert Einstein* (1875-1955)

Thinking must never submit itself, neither to a dogma, nor to a party, nor to a passion, nor to an interest, nor to a preconceived idea, nor to whatever it may be, if not to facts themselves, because, for it, to submit would be to cease to be. *Jules Henri Poincaré* (1854-1912)

This is really the cornerstone of our situation. Now, I believe what we should try to bring about is the general conviction that the first thing you have to abolish is war at all costs, and every other point of view must be of secondary importance. *Albert Einstein* (1875-1955)

This is the reason why all attempts to obtain a deeper knowledge of the foundations of physics seem doomed to me unless the basic concepts are in accordance with general relativity from the beginning. This situation makes it difficult to use our empirical knowledge, however comprehensive, in looking for the fundamental concepts and relations of physics, and it forces us to apply free speculation to a much greater extent than is presently assumed by most physicists. *Albert Einstein* (1875-1955)

This political movement has patently demonstrated that it will not defend the integrity of science in any case in which science runs afoul of its core political constituencies. In so doing, it has ceded any right to govern a technologically advanced and sophisticated nation. *Chris Mooney*

This theme of mutually invisible life at widely differing scales bears an important implication for the "culture wars" that supposedly now envelop our universities and our intellectual discourse in general... One side of this false dichotomy features the postmodern relativists who argue that all culturally bound modes of perception must be equally valid, and that no factual truth therefore exists. The other side includes the benighted, old-fashioned realists who insist that flies truly have two wings, and that Shakespeare really did mean what he thought he was saying. The principle of scaling provides a resolution for the false parts of this silly dichotomy. Facts are facts and cannot be denied by any rational being. (Often, facts are also not at all easy to determine or specify - but this question raises different issues for another time.) Facts, however, may also be highly scale dependent - and the perceptions of one world may have no validity or expression in the domain of another. The one-page map of Maine cannot recognize the separate boulders of Acadia, but both provide equally valid representations of a factual coastline. *Stephen Jay Gould* (1941-2002)

This topic brings me to that worst outcrop of the herd nature, the military system, which I abhor. That a man can take pleasure in marching in formation to the strains of a band is enough to make me despise him. He has only been given his big brain by mistake; a backbone was all he needed. This plague-spot of civilisation ought to be abolished with all possible speed. Heroism

by order, senseless violence, and all the pestilent nonsense that goes by the name of patriotism - how I hate them! War seems to me a mean, contemptible thing: I would rather be hacked in pieces than take part in such an abominable business. *Albert Einstein* (1875-1955)

Those people who think they know everything are a great annoyance to those of us who do. *Isaac Asimov* (1920-1992)

Those to whom God has imparted religion by intuition are very fortunate and justly convinced. But to those who do not have it, we can give it only by reasoning, waiting for God to give them spiritual insight. *Blaise Pascal* (1623-1662)

Those who have handled sciences have been either men of experiment or men of dogmas. The men of experiment are like the ant, they only collect and use; the reasoners resemble spiders, who make cobwebs out of their own substance. But the bee takes a middle course: it gathers its material from the flowers of the garden and of the field, but transforms and digests it by a power of its own. Not unlike this is the true business of philosophy; for it neither relies solely or chiefly on the powers of the mind, nor does it take the matter which it gathers from natural history and mechanical experiments and lay it up in the memory whole, as it finds it, but lays it up in the understanding altered and digested. Therefore from a closer and purer league between these two faculties, the experimental and the rational (such as has never yet been made), much may be hoped. *Sir Francis Bacon* (1561-1626)

Those who have taken upon them to lay down the law of nature as a thing already searched out and understood, whether they have spoken in simple assurance or professional affectation, have therein done philosophy and the sciences great injury. *Sir Francis Bacon* (1561-1626)

Those whose acquaintance with scientific research is derived chiefly from its practical results easily develop a completely false notion of the mentality of the men who, surrounded by a skeptical world, have shown the way to kindred spirits scattered wide through the world and through the centuries. *Albert Einstein* (1875-1955)

Through steady observation and a meaningful contact with the divined order of the world's structure, arranged by God's wisdom, - who would not be guided to admire the Builder who creates all! *Copernicus* (1473-1543)

Through the reading of popular scientific books I soon reached the conviction that much in the stories of the Bible could not be true. The consequence was a positively fanatic orgy of freethinking coupled with the impression that youth is intentionally being deceived by the state through lies; it was a crushing impression. Mistrust of every kind of authority grew out of this experience, a skeptical attitude toward the convictions that were alive in any specific social environment - an attitude that has never again left me, even though, later on, it has been tempered by a better insight into the causal connections. *Albert Einstein* (1875-1955)

Throughout his last half-dozen books, for example, Arthur Koestler has been conducting a campaign against his own misunderstanding of Darwinism. He hopes to find some ordering force, constraining evolution to certain directions and overriding the influence of natural selection... Darwinism is not the theory of capricious change that Koestler imagines. Random variation may be the raw material of change, but natural selection builds good design by rejecting most variants while accepting and accumulating the few that improve adaptation to local environments. *Stephen Jay Gould* (1941-2002)

Thus, we have three principles for increasing adequacy of data: if you must work with a single object, look for imperfections that record historical descent; if several objects are available, try to render them as stages of a single historical process; if processes can be directly observed, sum up their effects through time. One may discuss these principles directly or recognize the "little problems" that Darwin used to exemplify them: orchids, coral reefs, and worms - the middle book, the first, and the last. *Stephen Jay Gould* (1941-2002)

Thus you can throw yourself flat on the ground, stretched out upon Mother Earth, with certain conviction that you are one with her and she with you... For eternally and always there is only

- now, one and the same now; the present is the only thing that has no end. *Erwin Schrödinger* (1887-1961)
- Time, whose tooth gnaws away at everything else, is powerless against truth. *Thomas Henry Huxley* (1825-1895)
- Time's arrow of "just history" marks each moment of time with a distinctive brand. But we cannot, in our quest to understand history, be satisfied only with a mark to recognize each moment and a guide to order events in temporal sequence. Uniqueness is the essence of history, but we also crave some underlying generality, some principles of order transcending the distinction of moments - lest we be driven mad by Borges's vision of a new picture every two thousand pages in a book without end. We also need, in short, the immanence of time's cycle. *Stephen Jay Gould* (1941-2002)
- To doubt everything or to believe everything are two equally convenient solutions; both dispense with the necessity of reflection. *Jules Henri Poincaré* (1854-1912)
- To feel much for others and little for ourselves; to restrain our selfishness and exercise our benevolent affections, constitute the perfection of human nature. *Adam Smith* (1723-1790)
- To introduce something altogether new would mean to begin all over, to become ignorant again, and to run the old, old risk of failing to learn. *Isaac Asimov* (1920-1992)
- To know that we know what we know, and to know that we do not know what we do not know, that is true knowledge. *Copernicus* (1473-1543)
- To punish me for my contempt of authority, Fate has made me an authority myself. *Albert Einstein* (1879-1955)
- To suppose that the eye with all its inimitable contrivances for adjusting the focus to different distances, for admitting different amounts of light, and for the correction of spherical and chromatic aberration, could have been formed by natural selection, seems, I freely confess, absurd in the highest degree. When it was first said that the sun stood still and the world turned round, the common sense of mankind declared the doctrine false; but the old saying of *Vox populi, vox Dei*, as every philosopher knows, cannot be trusted in science. *Charles Darwin* (1809-1882)
- To surrender to ignorance and call it God has always been premature, and it remains premature today. *Isaac Asimov* (1920-1992)
- To take those fools in clerical garb seriously is to show them too much honor. *Albert Einstein* (1879-1955)
- Today we must abandon competition and secure cooperation. This must be the central fact in all our considerations of international affairs; otherwise we face certain disaster. Past thinking and methods did not prevent world wars. Future thinking must prevent wars. *Albert Einstein* (1879-1955)
- Today's scientists have substituted mathematics for experiments, and they wander off through equation after equation, and eventually build a structure which has no relation to reality. *Nikola Tesla* (1856-1943)
- Too many heretics are simply witch-hunters off on an unaccustomed tangent. *Henry Louis Mencken* (1880-1956)
- Too many of us look upon Americans as dollar chasers. This is a cruel libel, even if it is reiterated thoughtlessly by the Americans themselves. *Albert Einstein* (1879-1955)
- True literacy is becoming an arcane art and the United States is steadily dumbing down. *Isaac Asimov* (1920-1992)
- True majorities, in a TV-dominated and anti-intellectual age, may need sound bites and flashing lights - and I am not against supplying such lures if they draw children into even a transient concern with science. But every classroom has one [Oliver] Sacks, one [Eric] Korn, or one [Jonathan] Miller, usually a lonely child with a passionate curiosity about nature, and a zeal that overcomes pressures for conformity. Do not the one in fifty deserve their institutions as well -

magic places, like cabinet museums, that can spark the rare flames of genius? *Stephen Jay Gould* (1941-2002)

Truly grand and powerful theories... do not and cannot rest upon single observations. Evolution is an inference from thousands of independent sources, the only conceptual structure that can make unified sense of all this disparate information. The failure of a particular claim usually records a local error, not the bankruptcy of a central theory... If I mistakenly identify your father's brother as your own dad, you don't become genealogically rootless and created de novo. You still have a father; we just haven't located him properly. *Stephen Jay Gould* (1941-2002)

Truth is a naked and open daylight, that doth not shew the masks and mummeries and triumphs of the world, half so stately and daintily as candlelights. *Sir Francis Bacon* (1561-1626)

Truth is what stands the test of experience. *Albert Einstein* (1879-1955)

Truth will sooner come out from error than from confusion. *Sir Francis Bacon* (1561-1626)

Try and penetrate with our limited means the secrets of nature and you will find that, behind all the discernible concatenations, there remains something subtle, intangible and inexplicable. Veneration for this force beyond anything that we can comprehend is my religion. To that extent I am, in point of fact, religious. *Albert Einstein* (1879-1955)

Try not to become a man of success but rather try to become a man of value. *Albert Einstein* (1879-1955)

Try to become not a man of success, but try rather to become a man of value. *Albert Einstein* (1879-1955)

Try to learn something about everything and everything about something. *Thomas Henry Huxley* (1825-1895)

Two things are infinite: the universe and human stupidity; and I'm not sure about the universe. *Albert Einstein* (1879-1955)

Understanding a theory has... much in common with understanding a human personality. We may know or understand a man's system of dispositions pretty well; that is to say, we may be able to predict how he would act in a number of different situations. But since there are infinitely many possible situations, of infinite variety, a full understanding of a man's dispositions does not seem to be possible. *Karl Raimund Popper* (1902-1994)

Unthinking respect for authority is the greatest enemy of truth. *Albert Einstein* (1879-1955)

Until I became a published writer, I remained completely ignorant of books on how to write and courses on the subject... they would have spoiled my natural style; made me observe caution; would have hedged me with rules. *Isaac Asimov* (1920-1992)

Very few people, including authors willing to commit to paper, ever really read primary sources - certainly not in necessary depth and contemplation, and often not at all... When writers close themselves off to the documents of scholarship, and then rely only on seeing or asking, they become conduits and sieves rather than thinkers. When, on the other hand, you study the great works of predecessors engaged in the same struggle, you enter a dialogue with human history and the rich variety of our own intellectual traditions. You insert yourself, and your own organizing powers, into this history - and you become an active agent, not merely a "reporter." *Stephen Jay Gould* (1941-2002)

Very little comes easily to our poor, benighted species (the first creature, after all, to experiment with the novel evolutionary inventions of self-conscious philosophy and art). Even the most "obvious," "accurate," and "natural" style of thinking or drawing must be regulated by history and won by struggle. Solutions must therefore arise within a social context and record the complex interactions of mind and environment that define the possibility of human improvement. *Stephen Jay Gould* (1941-2002)

Violence is the last refuge of the incompetent. *Isaac Asimov* (1920-1992)

Wallace's error on human intellect arose from the inadequacy of his rigid selectionism, not from a failure to apply it. And his argument repays our study today, since its flaw persists as the weak

link in many of the most “modern” evolutionary speculations of our current literature. For Wallace's rigid selectionism is much closer than Darwin's pluralism to the attitude embodied in our favored theory today, which, ironically in this context, goes by the name of “Neo-Darwinism.” *Stephen Jay Gould* (1941-2002)

We are dealing with the best-educated generation in history. But they've got a brain dressed up with nowhere to go. *Timothy Francis Leary* (1920-1996)

We are made wise not by the recollection of our past, but by the responsibility for our future. *George Bernard Shaw* (1856-1950)

We build our personalities laboriously and through many years, and we cannot order fundamental changes just because we might value their utility; no button reading “positive attitude” protrudes from our hearts, and no finger can coerce positivity into immediate action by a single and painless pressing. *Stephen Jay Gould* (1941-2002)

We can allow satellites, planets, suns, universe, nay whole systems of universes, to be governed by laws, but the smallest insect, we wish to be created at once by special act. *Charles Darwin* (1809-1882)

We can found no scientific discipline, nor a hearty profession, on the technical mistakes of the Department of Defense and, mainly, one computer manufacturer. *Edsger W. Dijkstra* (1930–2002)

We can't solve problems by using the same kind of thinking we used when we created them. *Albert Einstein* (1879-1955)

We cannot despair of humanity, since we are ourselves human beings. *Albert Einstein* (1879-1955)

We cannot hope to fill the schools with persons of high intelligence, for persons of high intelligence simply refuse to spend their lives teaching such banal things as spelling and arithmetic. Among the teachers male we may safely assume that 95% are of low mentality, else they would depart for more appetizing pastures. And even among the teachers female the best are inevitably weeded out by marriage, and only the worst (with a few romantic exceptions) survive. *Henry Louis Mencken* (1880-1956)

We debase the richness of both nature and our own minds if we view the great pageant of our intellectual history as a compendium of new information leading from primal superstition to final exactitude. We know that the sun is hub of our little corner of the universe, and that ties of genealogy connect all living things on our planet, because these theories assemble and explain so much otherwise disparate and unrelated information - not because Galileo trained his telescope on the moons of Jupiter or because Darwin took a ride on a Galápagos tortoise. *Stephen Jay Gould* (1941-2002)

We didn't have the money, so we had to think. *Ernest Rutherford* (1871-1937)

We do live in a conceptual trough that encourages such yearning for unknown and romanticized greener pastures of other times. The future doesn't seem promising, if only because we can extrapolate some disquieting present trends into further deterioration: pollution, nationalism, environmental destruction, and aluminum bats. Therefore, we tend to take refuge in a rose-colored past... I do not doubt the salutary, even the essential, properties of this curiously adaptive human trait, but we must also record the down side. Legends of past golden ages become impediments when we try to negotiate our current dilemma. *Stephen Jay Gould* (1941-2002)

We do not belong to this material world that science constructs for us. We are not in it; we are outside. We are only spectators. The reason why we believe that we are in it, that we belong to the picture, is that our bodies are in the picture. Our bodies belong to it. Not only my own body, but those of my friends, also of my dog and cat and horse, and of all the other people and animals. And this is my only means of communicating with them. *Erwin Schrödinger* (1887-1961)

We do not inhabit a perfected world where natural selection ruthlessly scrutinizes all organic structures and then molds them for optimal utility. Organisms inherit a body form and a style of embryonic development; these impose constraints upon future change and adaptation. In many cases, evolutionary pathways reflect inherited patterns more than current environmental demands. These inheritances constrain, but they also provide opportunity. A potentially minor genetic change... entails a host of complex, nonadaptive consequences... What “play” would evolution have if each structure were built for a restricted purpose and could be used for nothing else? How could humans learn to write if our brain had not evolved for hunting, social cohesion, or whatever, and could not transcend the adaptive boundaries of its original purpose? *Stephen Jay Gould* (1941-2002)

We don't have the money, so we have to think. *Ernest Rutherford* (1871-1937)

We have just introduced the term gene for the hypothetical material carrier of a definite hereditary feature. *Erwin Schrödinger* (1887-1961)

We have not lost faith; we have transferred it from God to the medical profession. *George Bernard Shaw* (1856-1950)

We inhabit a complex world. Some boundaries are sharp and permit clean and definite distinctions. But nature also includes continua that cannot be neatly parceled into two piles of unambiguous yeses and noes. Biologists have rejected, as fatally flawed in principle, all attempts by anti-abortionists to define an unambiguous “beginning of life,” because we know so well that the sequence from ovulation or spermatogenesis to birth is an unbreakable continuum - and surely no one will define masturbation as murder. *Stephen Jay Gould* (1941-2002)

We learn from experience that men never learn anything from experience. *George Bernard Shaw* (1856-1950)

We live in a capitalist economy, and I have no particular objection to honorable self-interest. We cannot hope to make the needed, drastic improvement in primary and secondary education without a dramatic restructuring of salaries. In my opinion, you cannot pay a good teacher enough money to recompense the value of talent applied to the education of young children. I teach an hour or two a day to tolerably well-behaved near-adults - and I come home exhausted. By what possible argument are my services worth more in salary than those of a secondary-school teacher with six classes a day, little prestige, less support, massive problems of discipline, and a fundamental role in shaping minds. (In comparison, I only tinker with intellects already largely formed.) *Stephen Jay Gould* (1941-2002)

We live in an essential and unresolvable tension between our unity with nature and our dangerous uniqueness. Systems that attempt to place and make sense of us by focusing exclusively either on the uniqueness or the unity are doomed to failure. But we must not stop asking and questing because the answers are complex and ambiguous. *Stephen Jay Gould* (1941-2002)

We may assume the existence of an aether; only we must give up ascribing a definite state of motion to it, i.e. we must by abstraction take from it the last mechanical characteristic which Lorentz had still left it. *Albert Einstein* (1879-1955)

We may conclude that from what science teaches us, there is in nature an order independent of man's existence, a meaningful order to which nature and man are subordinate. Both Religion and science require faith in God. For believers, God is in the beginning, and for physicists He is at the end of all considerations. *Max Planck* (1858-1947)

We may need simple and heroic legends for that peculiar genre of literature known as the textbook. But historians must also labor to rescue human beings from their legends in science - if only so that we may understand the process of scientific thought aright. *Stephen Jay Gould* (1941-2002)

We must, however, acknowledge, as it seems to me, that man with all his noble qualities, with sympathy which feels for the most debased, with benevolence which extends not only to other men but to the humblest living creature, with his god-like intellect which has penetrated into the

movements and constitution of the solar system - with all these exalted powers - Man still bears in his bodily frame the indelible stamp of his lowly origin. *Charles Darwin* (1809-1882)

We must not put mistakes into programs because of sloppiness, we have to do it systematically and with care. *Edsger W. Dijkstra* (1930–2002)

We must therefore bear the undoubtedly bad effects of the weak surviving and propagating their kind; but there appears to be at least one check in steady action, namely that the weaker and inferior members of society do not marry so freely as the sound; and this check might be indefinitely increased by the weak in body or mind refraining from marriage, though this is more to be hoped for than expected. *Charles Darwin* (1809-1882)

We often think, naïvely, that missing data are the primary impediments to intellectual progress - just find the right facts and all problems will dissipate. But barriers are often deeper and more abstract in thought. We must have access to the right metaphor, not only to the requisite information. Revolutionary thinkers are not, primarily, gatherers of facts, but weavers of new intellectual structures. *Stephen Jay Gould* (1941-2002)

We owe a lot to the Indians, who taught us how to count, without which no worthwhile scientific discovery could have been made. *Albert Einstein* (1879-1955)

We see a universe marvelously arranged and obeying certain laws, but only dimly understand these laws. Our limited minds cannot grasp the mysterious force that moves the constellations. I am fascinated by Spinoza's pantheism, but admire even more his contributions to modern thought because he is the first philosopher to deal with the soul and the body as one, not two separate things. *Albert Einstein* (1879-1955)

We should take care not to make the intellect our god; it has, of course, powerful muscles, but no personality. *Albert Einstein* (1879-1955)

We should therefore, with grace and optimism, embrace NOMA's tough-minded demand: Acknowledge the personal character of these human struggles about morals and meanings, and stop looking for definite answers in nature's construction. But many people cannot bear to surrender nature as a “transitional object” - a baby's warm blanket for our adult comfort. But when we do (for we must), nature can finally emerge in her true form: not as a distorted mirror of our needs, but as our most fascinating companion. Only then can we unite the patches built by our separate magisteria into a beautiful and coherent quilt called wisdom. *Stephen Jay Gould* (1941-2002)

We've arranged a civilization in which most crucial elements profoundly depend on science and technology. We have also arranged things so that almost no one understands science and technology. This is a prescription for disaster. We might get away with it for a while, but sooner or later this combustible mixture of ignorance and power is going to blow up in our faces. *Carl Sagan* (1934-1996)

We've discovered the secret of life. *Francis Crick* (1916-2004)

Weakness of attitude becomes weakness of character. *Albert Einstein* (1879-1955)

Well, evolution is a theory. It is also a fact. And facts and theories are different things, not rungs in a hierarchy of increasing certainty. Facts are the world's data. Theories are structures of ideas that explain and interpret facts. Facts do not go away while scientists debate rival theories for explaining them. Einstein's theory of gravitation replaced Newton's, but apples did not suspend themselves in mid-air pending the outcome. And human beings evolved from apelike ancestors whether they did so by Darwin's proposed mechanism or by some other, yet to be discovered... Evolutionists make no claim for perpetual truth, though creationists often do (and then attack us for a style of argument that they themselves favor). In science, “fact” can only mean “confirmed to such a degree that it would be perverse to withhold provisional assent.” I suppose that apples might start to rise tomorrow, but the possibility does not merit equal time in physics classrooms. *Stephen Jay Gould* (1941-2002)



- Western field-work conjures up images of struggle on horseback... - toughing it out on one canteen a day as you labor up and down mountains. The value of a site is supposedly correlated with the difficulty of getting there. This, of course, is romantic drivel. Ease of access is no measure of importance. The famous La Brea tar pits are right in downtown Los Angeles. To reach the Clarkia lake beds, you turn off the main road at Buzzard's Roost Trophy Company and drive the remaining fifty yards right up to the site. *Stephen Jay Gould* (1941-2002)
- What does a fish know about the water in which it swims all its life? *Albert Einstein* (1879-1955)
- What humanity owes to personalities like Buddha, Moses, and Jesus ranks for me higher than all the achievements of the enquiring and constructive mind. What these blessed men have given us we must guard and try to keep alive with all our strength if humanity is not to lose its dignity, the security of its existence, and its joy in living. *Albert Einstein* (1879-1955)
- What intellectual phenomenon can be older, or more oft repeated, than the story of a large research program that impaled itself upon a false central assumption accepted by all practitioners? Do we regard all people who worked within such traditions as dishonorable fools? What of the scientists who assumed that the continents were stable, that the hereditary material was protein, or that all other galaxies lay within the Milky Way? These false and abandoned efforts were pursued with passion by brilliant and honorable scientists. How many current efforts, now commanding millions of research dollars and the full attention of many of our best scientists, will later be exposed as full failures based on false premises? *Stephen Jay Gould* (1941-2002)
- What is a scientist after all? It is a curious person looking through a keyhole, the keyhole of nature, trying to know what's going on. *Jacques-Yves Cousteau* (1910-1997)
- What is the meaning of human life, or of organic life altogether? To answer this question at all implies a religion. Is there any sense then, you ask, in putting it? I answer, the man who regards his own life and that of his fellow creatures as meaningless is not merely unfortunate but almost disqualified for life. *Albert Einstein* (1879-1955)
- What is the use of straining after an amiable view of things, when a cynical view is most likely to be the true one? *George Bernard Shaw* (1856-1950)
- What must be an essential feature of any future fundamental physics? *Albert Einstein* (1879-1955)
- What really interests me is whether God had any choice in the creation of the world. *Albert Einstein* (1879-1955)
- What we want is to see the child in pursuit of knowledge, and not knowledge in pursuit of the child. *George Bernard Shaw* (1856-1950)
- When a man sits with a pretty girl for an hour, it seems like a minute. But let him sit on a hot stove for a minute - then it is longer than any hour. That's relativity. *Albert Einstein* (1879-1955)
- When Bonner writes that "natural selection for optimal feeding is then presumed to be the cause of non-motility in all forms," I can't help suspecting that some plants might do even better if they could walk from shade to sun - but the inherited constraints of design never permitted a trial of this intriguing option. *Stephen Jay Gould* (1941-2002)
- When I came back from Munich, it was September, and I was Professor of Mathematics at the Eindhoven University of Technology. Later I learned that I had been the Department's third choice, after two numerical analysts had turned the invitation down; the decision to invite me had not been an easy one, on the one hand because I had not really studied mathematics, and on the other hand because of my sandals, my beard and my "arrogance" (whatever that may be). *Edsger W. Dijkstra* (1930-2002)
- When I examine myself and my methods of thought, I come to the conclusion that the gift of fantasy has meant more to me than my talent for absorbing positive knowledge. *Albert Einstein* (1879-1955)
- When I read about the way in which library funds are being cut and cut, I can only think that American society has found one more way to destroy itself. *Isaac Asimov* (1920-1992)

- When I read the Bhagavad Gita and reflect about how God created this universe everything else seems so superfluous. *Albert Einstein* (1879-1955)
- When I was young I observed that nine out of every ten things I did were failures, so I did ten times more work. *George Bernard Shaw* (1856-1950)
- When puzzled, it never hurts to read the primary documents - a rather simple and self-evident principle that has, nonetheless, completely disappeared from large sectors of the American experience. *Stephen Jay Gould* (1941-2002)
- When the number of factors coming into play in a phenomenological complex is too large, scientific method in most cases fails us. One need only think of the weather, in which case prediction even for a few days ahead is impossible. Nevertheless no one doubts that we are confronted with a causal connection whose causal components are in the main known to us. *Albert Einstein* (1879-1955)
- When the principles of breeding and of inheritance are better understood, we shall not hear ignorant members of our legislature rejecting with scorn a plan for ascertaining by an easy method whether or not consanguineous marriages are injurious to man. *Charles Darwin* (1809-1882)
- When the solution is simple, God is answering. Where the world ceases to be the scene of our personal hopes and wishes, where we face it as free beings admiring, asking and observing, there we enter the realm of Art and Science. *Albert Einstein* (1879-1955)
- When two people are under the influence of the most violent, most insane, most delusive, and most transient of passions, they are required to swear that they will remain in that exalted, abnormal, and exhausting condition continuously until death do them part. *George Bernard Shaw* (1856-1950)
- When we had no computers, we had no programming problem either. When we had a few computers, we had a mild programming problem. Confronted with machines a million times as powerful, we are faced with a gigantic programming problem. *Edsger W. Dijkstra* (1930-2002)
- When we seek a textbook case for the proper operation of science, the correction of certain error offers far more promise than the establishment of probable truth. Confirmed hunches, of course, are more upbeat than discredited hypotheses. Since the worst traditions of "popular" writing falsely equate instruction with sweetness and light, our promotional literature abounds with insipid tales in the heroic mode, although tough stories of disappointment and loss give deeper insight into a methodology that the celebrated philosopher Karl Popper once labeled as "conjecture and refutation." *Stephen Jay Gould* (1941-2002)
- When we survey our lives and endeavours we soon observe that almost the whole of our actions and desires are bound up with the existence of other human beings. We see that our whole nature resembles that of the social animals. We eat food that others have grown, wear clothes that others have made, live in houses that others have built. The greater part of our knowledge and beliefs has been communicated to us by other people through the medium of a language which others have created. Without language our mental capacities would be poor indeed, comparable to those of the higher animals; we have, therefore, to admit that we owe our principal advantage over the beasts to the fact of living in human society. The individual, if left alone from birth would remain primitive and beast-like in his thoughts and feelings to a degree that we can hardly conceive. The individual is what he is and has the significance that he has not so much in virtue of his individuality, but rather as a member of a great human society, which directs his material and spiritual existence from the cradle to the grave. *Albert Einstein* (1879-1955)
- Where any answer is possible, all answers are meaningless. *Isaac Asimov* (1920-1992)
- Where is the life we have lost in living? Where is the wisdom we have lost in knowledge? Where is the knowledge we have lost in information? *T. S. Elliot* (1885-1968)
- Where the world ceases to be the scene of our personal hopes and wishes, where we face it as free beings admiring, asking and observing, there we enter the realm of Art and Science. *Albert Einstein* (1879-1955)

- Where there is the necessary technical skill to move mountains, there is no need for the faith that moves mountains. *Eric Hoffer* (1902-1983)
- Whether you can observe a thing or not depends on the theory which you use. It is the theory which decides what can be observed. *Albert Einstein* (1879-1955)
- While it is true that scientific results are entirely independent from religious or moral considerations, those individuals to whom we owe the great creative achievements of science were all of them imbued with the truly religious conviction that this universe of ours is something perfect and susceptible to the rational striving for knowledge. If this conviction had not been a strongly emotional one and if those searching for knowledge had not been inspired by Spinoza's *Amor Dei Intellectualis*, they would hardly have been capable of that untiring devotion which alone enables man to attain his greatest achievements. *Albert Einstein* (1879-1955)
- While religion prescribes brotherly love in the relations among the individuals and groups, the actual spectacle more resembles a battlefield than an orchestra. Everywhere, in economic as well as in political life, the guiding principle is one of ruthless striving for success at the expense of one's fellow men. This competitive spirit prevails even in school and, destroying all feelings of human fraternity and cooperation, conceives of achievement not as derived from the love for productive and thoughtful work, but as springing from personal ambition and fear of rejection. *Albert Einstein* (1879-1955)
- Who are we? The answer to this question is not only one of the tasks but the task of science. *Erwin Schrödinger* (1887-1961)
- Whoever undertakes to set himself up as a judge of Truth and knowledge is shipwrecked by the laughter of the gods. *Albert Einstein* (1879-1955)
- Why has elegance found so little following? Elegance has the disadvantage that hard work is needed to achieve it and a good education to appreciate it. *Edsger W. Dijkstra* (1930–2002)
- Will we ever again be able to view a public object with civic dignity, unencumbered by commercial messages? Must city buses be fully painted as movable ads, lampposts smothered, taxis festooned, even seats in concert halls sold one by one to donors and embellished in perpetuity with their names on silver plaques? *Stephen Jay Gould* (1941-2002)
- Wisdom is not a product of schooling but of the lifelong attempt to acquire it. *Albert Einstein* (1879-1955)
- With highly civilised nations continued progress depends in a subordinate degree on natural selection; for such nations do not supplant and exterminate one another as do savage tribes. Nevertheless the more intelligent members within the same community will succeed better in the long run than the inferior, and leave a more numerous progeny, and this is a form of natural selection. *Charles Darwin* (1809-1882)
- With savages, the weak in body or mind are soon eliminated; and those that survive commonly exhibit a vigorous state of health. We civilised men, on the other hand, do our utmost to check the process of elimination; we build asylums for the imbecile, the maimed, and the sick; we institute poor-laws; and our medical men exert their utmost skill to save the life of every one to the last moment. *Charles Darwin* (1809-1882)
- Without some kind of God, man is not even very interesting. *T. S. Elliot* (1885-1968)
- Women decide the larger questions of life correctly and quickly, not because they are lucky guessers, not because they practise a magic inherited from savagery, but simply and solely because they have sense. They see at a glance what most men could not see with searchlights and telescopes. *Henry Louis Mencken* (1880-1956)
- Words change their meanings, just as organisms evolve. We would impose an enormous burden on our economy if we insisted on payment in cattle every time we identified a bonus as a pecuniary advantage (from the Latin *pecus*, or cattle, a verbal fossil from a former commercial reality). *Stephen Jay Gould* (1941-2002)

Working on the final formulation of technological patents was a veritable blessing for me. It enforced many-sided thinking and also provided important stimuli to physical thought. Academia places a young person under a kind of compulsion to produce impressive quantities of scientific publications - a temptation to superficiality. *Albert Einstein* (1879-1955)

Write a paper promising salvation, make it a 'structured' something or a 'virtual' something, or 'abstract', 'distributed' or 'higher-order' or 'applicative' and you can almost be certain of having started a new cult. *Edsger W. Dijkstra* (1930-2002)

Writing, to me, is simply thinking through my fingers. *Isaac Asimov* (1920-1992)

Yes, Shakespeare foremost and forever (Darwin too). But also teach about the excellence of pygmy bushcraft and Fuegian survival in the world's harshest climate. Dignity and inspiration come in many guises. Would anyone choose the tinhorn patriotism of George Armstrong Custer over the eloquence of Chief Joseph in defeat? *Stephen Jay Gould* (1941-2002)

Yes, we have to divide up our time like that, between our politics and our equations. But to me our equations are far more important, for politics are only a matter of present concern. A mathematical equation stands forever. *Albert Einstein* (1879-1955)

Yet I also appreciate that we cannot win this battle to save species and environments without forging an emotional bond between ourselves and nature as well - for we will not fight to save what we do not love (but only appreciate in some abstract sense). So let them all continue - the films, the books, the television programs, the zoos, the little half acre of ecological preserve in any community, the primary school lessons, the museum demonstrations, even... the 6:00 A.M. bird walks. Let them continue and expand because we must have visceral contact in order to love. We really must make room for nature in our hearts. *Stephen Jay Gould* (1941-2002)

You can certainly destroy enough of humanity so that only the greatest act of faith can persuade you that what's left will be human. *Julius Robert Oppenheimer* (1904-1967)

You cannot simultaneously prevent and prepare for war. *Albert Einstein* (1879-1955)

You must not give the world what it asks for, but what it needs. *Edsger W. Dijkstra* (1930-2002)

You see, wire telegraph is a kind of a very, very long cat. You pull his tail in New York and his head is meowing in Los Angeles. Do you understand this? And radio operates exactly the same way: you send signals here, they receive them there. The only difference is that there is no cat. *Albert Einstein* (1879-1955), when asked to describe radio.

You should never bet against anything in science at odds of more than about 10-12 to 1. *Ernest Rutherford* (1871-1937)

Zoocentrism is the primary fallacy of human sociobiology, for this view of human behavior rests on the argument that if the actions of "lower" animals with simple nervous systems arise as genetic products of natural selection, then human behavior should have a similar basis. *Stephen Jay Gould* (1941-2002)