

QUOTES: (updated 1/13/2010)

Throughout the history of human thought, it has been convenient and inspirational to designate the summit of the hierarchy as God. While it is not necessary for science to use this term, it is important for scientists to grasp the hierarchical reality it signifies. (Gilder)

The deepest sin against the human mind is to believe things without evidence. Science is simply common sense at its best - that is, rigidly accurate in observation, and merciless to fallacy in logic. (**Thomas Huxley**)

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, Introduction to The Descent of Man, 1871**)

We are to admit no more causes of natural things than such as are both true and sufficient to explain their appearances. (**Sir Isaac Newton, Principia: The system of the world**)

(**Galileo Galilei, 1600**) I wish, my dear Kepler, that we could have a good laugh together at the extraordinary stupidity of the mob. What do you think of the foremost philosophers of this University? In spite of my oft-repeated efforts and invitations, they have refused, with the obstinacy of a gluttoned adder, to look at the planets or Moon or my telescope. ... In questions of science, the authority of a thousand is not worth the humble reasoning of a single individual.

(**Max Planck, 1920**) A new scientific truth does not triumph by convincing its opponents and making them see the light, but rather because its opponents eventually die, and a new generation grows up that is familiar with it

Someday we'll understand the whole thing as one single marvelous vision that will seem so overwhelmingly simple and beautiful that we may say to each other; 'Oh, how could we have been so stupid for so long? How could it have been otherwise!' (**J. A. Wheeler**)

What we observe as material bodies and forces are nothing but shapes and variations in the structure of space. Particles are just *schaumkommen* (appearances). ... 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. ... Let me say at the outset, that in this discourse, I am opposing not a few special statements of quantum physics held today (1950s), I am opposing as it were the whole of it, I am opposing its basic views that have been shaped 25 years ago, when Max Born put forward his probability interpretation, which was accepted by almost everybody. I don't like it, and I'm sorry I ever had anything to do with it. (**Erwin Schrödinger, The Interpretation of Quantum Physics.**)

All these fifty years of conscious brooding have brought me no nearer to the answer to the question, 'What are light quanta?' Nowadays every Tom, Dick and Harry thinks he knows it, but he is mistaken. ... I consider it quite possible that physics cannot be based on the field concept, i.e., on continuous structures. In that case, nothing remains of my entire castle in the air, gravitation theory included, [and of] the rest of modern physics. (**Albert Einstein, 1954**)

From the latest results of the theory of relativity it is probable that our three dimensional space is also approximately spherical, that is, that the

laws of disposition of rigid bodies in it are not given by Euclidean geometry, but approximately by spherical geometry. (**Albert Einstein, 1954**)

Special relativity is still based directly on an empirical law, that of the constancy of the velocity of light where $dx^2 + dy^2 + dz^2 = (cdt)^2$ and cdt is the distance traveled by light c in time dt . The defining equation of the metric is then nothing but the Pythagorean theorem applied to the differentials of the co-ordinates. (Note: In the above diagram $dx=3$, $dy=4$, $dz=0$, $cdt=5$) In the special theory of relativity those co-ordinate changes (by transformation) are permitted for which also in the new co-ordinate system the quantity $(cdt)^2$ equals the sum of the squares of the co-ordinate differentials. Such transformations are called Lorentz transformations. (**Albert Einstein, 1934**)

Movement, then, is also continuous in the way in which time is - indeed time is either identical to movement or is some affection of it. ... there being two causes of which we have defined in the Physics, that of matter and that from which the motion comes. (**Aristotle, Metaphysics**)

(**Bradley, 1846-1924**) We may agree, perhaps, to understand by Metaphysics an attempt to know reality as against mere appearance, or the study of first principles or ultimate truths, or again the effort to comprehend the universe, not simply piecemeal or by fragments, but somehow as a whole.

(**Aristotle, 340BC**) The first philosophy (Metaphysics) is universal and is exclusively concerned with primary substance. ... And here we will have the science to study that which is just as that which is, both in its essence and in the properties which, just as a thing that is, it has. ... That among entities there must be some cause which moves and combines

things. ... There must then be a principle of such a kind that its substance is activity.

(Gottfried Leibniz, 1646 - 1716) Reality cannot be found except in One single source, because of the interconnection of all things with one another. ... I do not conceive of any reality at all as without genuine unity. ... I maintain also that substances, whether material or immaterial, cannot be conceived in their bare essence without any activity, activity being of the essence of substance in general.

Simplicity is the ultimate sophistication. **(Leonardo da Vinci)**
Introduction:

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)**

[A stupid man's report of what a clever man says can never be accurate, because he unconsciously translates what he hears into something he can understand.](#)



Bertrand Russell

[All movements go too far.](#)



Bertrand Russell

[Do not fear to be eccentric in opinion, for every opinion now accepted was once eccentric.](#)



Bertrand Russell

[Everything is vague to a degree you do not realize till you have tried to make it precise.](#)



Bertrand Russell

[Government can easily exist without laws, but law cannot exist without government.](#)



Bertrand Russell

[I think we ought always to entertain our opinions with some measure of doubt. I shouldn't wish people dogmatically to believe any philosophy, not even mine.](#)



Bertrand Russell

- More quotations on: [\[Opinions\]](#) [\[Doubt\]](#) [\[Philosophy\]](#)

[I would never die for my beliefs because I might be wrong.](#)



Bertrand Russell

- More quotations on: [\[Belief\]](#)

If a man is offered a fact which goes against his instincts, he will scrutinize it closely, and unless the evidence is overwhelming, he will refuse to believe it. If, on the other hand, he is offered something which affords a reason for acting in accordance to his instincts, he will accept it even on the slightest evidence. The origin of myths is explained in this way.



Bertrand Russell

- More quotations on: [\[Instinct\]](#)

If there were in the world today any large number of people who desired their own happiness more than they desired the unhappiness of others, we could have paradise in a few years.



Bertrand Russell

In all affairs it's a healthy thing now and then to hang a question mark on the things you have long taken for granted.



Bertrand Russell

- More quotations on: [\[Questioning\]](#)

In the part of this universe that we know there is great injustice, and often the good suffer, and often the wicked prosper, and one hardly knows which of those is the more annoying.



Bertrand Russell

- More quotations on: [\[Suffering\]](#)

It has been said that man is a rational animal. All my life I have been searching for evidence which could support this.



Bertrand Russell

- More quotations on: [\[Mankind\]](#)

It is a waste of energy to be angry with a man who behaves badly, just as it is to be angry with a car that won't go.



Bertrand Russell

Life is nothing but a competition to be the criminal rather than the victim.



Bertrand Russell

- More quotations on: [\[Crime\]](#)

Many people would sooner die than think; In fact, they do so.



Bertrand Russell

Mathematics, rightly viewed, possesses not only truth, but supreme beauty - a beauty cold and austere, like that of sculpture.



Bertrand Russell

- More quotations on: [\[Mathematics\]](#)

Men fear thought as they fear nothing else on earth -- more than ruin -- more even than death.... Thought is subversive and revolutionary, destructive and terrible, thought is merciless to privilege, established institutions, and comfortable habit. Thought looks into the pit of hell and is not afraid. Thought is great and swift and free, the light of the world, and the chief glory of man.



Bertrand Russell

- More quotations on: [\[Intelligence\]](#)

[No one gossips about other people's secret virtues.](#)



Bertrand Russell

- More quotations on: [\[Gossip\]](#) [\[Secrets\]](#)

[Our great democracies still tend to think that a stupid man is more likely to be honest than a clever man.](#)



Bertrand Russell

[Passive acceptance of the teacher's wisdom is easy to most boys and girls. It involves no effort of independent thought, and seems rational because the teacher knows more than his pupils; it is moreover the way to win the favour of the teacher unless he is a very exceptional man. Yet the habit of passive acceptance is a disastrous one in later life. It causes man to seek and to accept a leader, and to accept as a leader whoever is established in that position.](#)



Bertrand Russell

- More quotations on: [\[Teaching\]](#)

[Patriotism is the willingness to kill and be killed for trivial reasons.](#)



Bertrand Russell

- More quotations on: [\[Patriotism\]](#)

[Patriots always talk of dying for their country but never of killing for their country.](#)



Bertrand Russell

[Science may set limits to knowledge, but should not set limits to imagination.](#)



Bertrand Russell

- More quotations on: [\[Science\]](#)

[So far as I can remember, there is not one word in the Gospels in praise of intelligence.](#)



Bertrand Russell

- More quotations on: [\[Intelligence\]](#)

[The good life, as I conceive it, is a happy life. I do not mean that if you are good you will be happy - I mean that if you are happy you will be good.](#)



Bertrand Russell

[The greatest challenge to any thinker is stating the problem in a way that will allow a solution.](#)



Bertrand Russell

[The main things which seem to me important on their own account, and not merely as means to other things, are knowledge, art, instinctive happiness, and relations of friendship or affection.](#)



Bertrand Russell

The most savage controversies are those about matters as to which there is no good evidence either way.



Bertrand Russell

The people who are regarded as moral luminaries are those who forego ordinary pleasures themselves and find compensation in interfering with the pleasures of others.



Bertrand Russell

- More quotations on: [\[Morality\]](#)

The place of the father in the modern suburban family is a very small one, particularly if he plays golf.



Bertrand Russell