

# Werner Heisenberg

## Quotes

*Science, Reality, Two, Thinking, Philosophy, Nature, Ideas, Understanding,  
Atoms, Fundamentals, Mistake, Different, May, Believe, Law, Real, Wave,  
Errors, Doe, Path*

When I meet God, I am going to ask him two questions: Why relativity ? And why turbulence ? I really believe he will have an answer for the first.

~Werner Heisenberg

What we observe is not nature itself, but nature exposed to our method of questioning.

~Werner Heisenberg

Only a few know, how much one must know to know how little one knows.

~Werner Heisenberg

Not only is the Universe stranger than we think, it is stranger than we can think.

~Werner Heisenberg

After the conversations about Indian philosophy, some of the ideas of Quantum Physics that had seemed so crazy suddenly made much more sense.

~Werner Heisenberg

[T]he atoms or elementary particles themselves are not real; they form a world of potentialities or possibilities rather than one of things or facts.

~Werner Heisenberg

"Uncertainty" is NOT "I don't know." It is "I can't know." "I am uncertain" does not mean "I could be certain."

~Werner Heisenberg

The more closely you look at one thing, the less closely can you see something else.

~Werner Heisenberg

Looking at something changes it.

~Werner Heisenberg

The reality we can put into words is never reality itself.

~Werner Heisenberg

The 'path' comes into existence only when we observe it.

~Werner Heisenberg

An expert is someone who knows some of the worst mistakes that can be made in his subject and how to avoid them.

~Werner Heisenberg

The more precise the measurement of position, the more imprecise the measurement of momentum, and vice versa.

~Werner Heisenberg

There is a fundamental error in separating the parts from the whole, the mistake of atomizing what should not be atomized. Unity and complementarity constitute reality.

~Werner Heisenberg

The one who insists on never uttering an error must remain silent.

~Werner Heisenberg

There are things that are so serious that you can only joke about them.

~Werner Heisenberg

The existing scientific concepts cover always only a very limited part of reality, and the other part that has not yet been understood is infinite.

~Werner Heisenberg

Thus, the more precisely the position is determined, the less precisely the momentum is known, and conversely.

~Werner Heisenberg

Unless you stake your life, life will not be won.

~Werner Heisenberg

Science clears the fields on which technology can build.

~Werner Heisenberg

Whenever we proceed from the known to the unknown we may hope to understand, but we may have to learn at the same time a new meaning of the word 'understanding'

~Werner Heisenberg

...separation of the observer from the phenomenon to be observed is no longer possible.

~Werner Heisenberg

Every experiment destroys some of the knowledge of the system which was obtained by previous experiments.

~Werner Heisenberg

By getting to smaller and smaller units, we do not come to fundamental or indivisible units. But we do come to a point where further division has no meaning.

~Werner Heisenberg

It will never be possible by pure reason to arrive at some absolute truth.

~Werner Heisenberg

My mind was formed by studying philosophy, Plato and that sort of thing.

~Werner Heisenberg

Nonsense. Space is blue and birds fly through it.

~Werner Heisenberg

Natural science, does not simply describe and explain nature; it is part of the interplay between nature and ourselves

~Werner Heisenberg

The very act of observing disturbs the system.

~Werner Heisenberg

Quantum theory provides us with a striking illustration of the fact that we can fully understand a connection though we can only speak of it in images and parables.

~Werner Heisenberg

Every tool carries with it the spirit by which it has been created.

~Werner Heisenberg

We will have to abandon the philosophy of Democritus and the concept of elementary particles. We should accept instead the concept of elementary symmetries.

~Werner Heisenberg

I believe that the existence of the classical "path" can be pregnantly formulated as follows: The "path" comes into existence only when we observe it.

~Werner Heisenberg

Nature is made in such a way as to be able to be understood. Or perhaps I should put it-more correctly-the other way around, and say that we are made in such a way as to be able to understand Nature.

~Werner Heisenberg

The Same organizing forces that have shaped nature in all her forms

are also responsible for the structure of our minds.

~Werner Heisenberg

Whether we electrons, light quanta, benzol molecules, or stones, we shall always come up against these two characteristics, the corpuscular and the undular.

~Werner Heisenberg

The world thus appears as a complicated tissue of events, in which connections of different kinds alternate or overlap or combine and thereby determine the texture of the whole.

~Werner Heisenberg

Every word or concept, clear as it may seem to be, has only a limited range of applicability.

~Werner Heisenberg

I think that the discovery of antimatter was perhaps the biggest jump of all the big jumps in physics in our century.

~Werner Heisenberg

The discontinuous 'reduction of the wave packets' which cannot be derived from Schroedinger's equation is ... a consequence of the transition from the possible to the actual.

~Werner Heisenberg

The problems of language here are really serious. We wish to speak in some way about the structure of the atoms. But we cannot speak about atoms in ordinary language.

~Werner Heisenberg

The basic idea is to shove all fundamental difficulties onto the neutron and to do quantum mechanics in the nucleus.

~Werner Heisenberg

It is probably true quite generally that in the history of human thinking the most fruitful developments frequently take place at those points where two different lines of thought meet.

~Werner Heisenberg

Even for the physicist the description in plain language will be a criterion of the degree of understanding that has been reached.

~Werner Heisenberg

Nature allows only experimental situations to occur which can be described within the framework of the formalism of quantum mechanics

~Werner Heisenberg

In general, scientific progress calls for no more than the absorption and elaboration of new ideas- and this is a call most scientists are happy to heed.

~Werner Heisenberg

In my paper the fact the  $XY$  was not equal to  $YX$  was very disagreeable to me. I felt this was the only point of difficulty in the whole scheme...and I was not able to solve it.

~Werner Heisenberg

A consistent pursuit of classical physics forces a transformation in the very heart of that physics.

~Werner Heisenberg

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