



Image: courtesy Palazzo Editions, from *Einstein: A Hundred Years of Relativity* by Andrew Robinson. See page 59 for a review

## The Mathematician and the Mystic

What is reality? **Andrew Robinson** and **Dipankar Home** shed some light on the big question that occupied Einstein and Tagore whenever they met

“If the moon, in the act of completing its eternal way around the earth, were gifted with self-consciousness, it would feel thoroughly convinced that it was travelling its way of its own accord on the strength of a resolution taken once and for all,” Albert Einstein wrote in 1930 in a little-known statement entitled *About Free Will*. “Man defends himself from being regarded as an impotent object in the course of the Universe. But should the lawfulness of events, such as unveils itself more or less clearly in inorganic nature, cease to function in front of the activities in our brain?”

Einstein was addressing Rabindranath Tagore in a contribution to a *Festschrift* for Tagore’s 70th birthday. During 1930 the two men had a number of meetings in which they discussed the nature of reality and the relationship of determinism to free will, and they differed from each other profoundly. Publicised at the time – initially in *The New York Times* – the Einstein-Tagore talks continue to spark interest because they tackle some of the fundamental questions debated since the advent of quantum theory.

The philosopher Sir Isaiah Berlin, who regarded Tagore as a “highly gifted thinker”, called the talks “a complete non-meeting of minds”. Ilya Prigogine, a Nobel laureate in chemistry, went so far as to say: “Curiously enough, the present evolution of science is running in the direction stated by the great Indian poet.”

A comparable mismatch occurred, famously, between Einstein and Niels Bohr, and lasted for 30 years, right up to Einstein’s death in 1955. A frustrated Bohr was never able to bring Einstein round to accepting the majority view of quantum theory.

Einstein, as he aged, adhered to a belief in realism – that the physical world has objectivity that transcends direct experience, and that propositions are true or false independent of our ability to discern which they are. Provoked by Tagore, Einstein expressed this belief in a remarkably clear-cut fashion:

**Einstein:** There are two different conceptions about the nature of the universe – the world as a unity dependent on humanity, and the world as reality independent of the human factor.

**Tagore:** This world is a human world – the scientific view of it is also that of the scientific man. Therefore, the world apart

from us does not exist; it is a relative world, depending for its reality upon our consciousness.

A little later, Einstein took up the point again:

**Einstein:** Truth, then, or beauty, is not independent of man?

**Tagore:** No.

**Einstein:** If there were no human beings any more, the Apollo Belvedere no longer would be beautiful?

**Tagore:** No.

**Einstein:** I agree with regard to this conception of beauty, but not with regard to truth.

**Tagore:** Why not? Truth is realised through men.

**Einstein:** I cannot prove my conception is right, but that is my religion.

After some further discussion – in which Einstein asserted, “I cannot prove, but I believe in the Pythagorean argument, that the truth is independent of human beings” – Einstein became concrete: “The mind acknowledges realities outside of it, independent of it. For instance, nobody may be in this house, yet that table remains where it is.”

**Tagore:** Yes, it remains outside the individual mind, but not the universal mind. The table is that which is perceptible by some kind of consciousness we possess.

**Einstein:** If nobody were in the house the table would exist all the same, but this is already illegitimate from your point of view, because we cannot explain what it means, that the table is there, independently of us. Our natural point of view in regard to the existence of truth apart from humanity cannot be explained or proved, but it is a belief which nobody can lack. We attribute to truth a superhuman objectivity.

**Tagore:** If there be any truth absolutely unrelated to humanity, then for us it is absolutely non-existing.

**Einstein:** Then I am more religious than you are!

(Here, said the note-taker, Einstein “exclaimed in triumph”).

The position of Einstein in this last extract is reminiscent of his well-known paradox: “The most incomprehensible fact about Nature is that it is comprehensible.” Nature, for Einstein, had to be independent of man and mind. He could not accept any idea that a universal mind might control Nature. Tagore, by contrast, could accept this. He did not adhere either to Einstein’s realist, objective position or to Bohr’s quasi-positivist, essentially subjective view of Nature, a position that, taken to its logical extreme, denies the existence of the physical world – or at least its dynamical properties – until they are measured. Tagore did not deny the existence of the table when nobody was in the house, but he argued that its existence becomes meaningful for us only when it is perceived by some conscious mind. And he said, further, that there is a universality in the nature of consciousness.

What did Tagore mean by this concept of a universal human mind? He once wrote: “The Universe is like a cobweb and minds are the spiders; for mind is one as well as many.” Pursuing the example of the table with Einstein, he said: “Science has proved that the table as a solid object is an appearance and therefore that which the human mind perceives as a table would not exist if that mind were naught. At the same time it must be admitted that the fact that the physical reality of the table is nothing but a multitude of separate revolving centres of electric force also belongs to the human mind. There is an

eternal conflict between the universal human mind and the same mind confined in the individual.”

Einstein was committed to the realism, determinism and strict causality of classical physics, as he made plain to Tagore in their second, more free-ranging conversation:

**Tagore:** I was discussing with Dr Mendel [a friend of Einstein] the new mathematical discoveries that tell us that in the realm of atoms chance has its play; the drama of existence is not absolutely predestined in character.

**Einstein:** The facts that make science tend towards this view do not say goodbye to causality.

**Tagore:** Maybe not; but it appears that the idea of causality is not in the elements, that some other force builds up with them an organised universe.

**Einstein:** One tries to understand how the order is the higher plane. The order is there, where the big elements combine and guide existence; but in the minute elements this order is not perceptible.

**Tagore:** This duality is in the depths of existence – the contradiction of free impulse and directive will which works upon it and evolves an orderly scheme of things.

**Einstein:** Modern physics would not say they are contradictory. Clouds look as one from a distance, but if you see them near, they show themselves in disorderly drops of water.

**Tagore:** Are the elements rebellious, dynamic with individual impulse? And is there a principle in the physical world which dominates them and puts them into an orderly organisation?

**Einstein:** Even the elements are not without statistical order; elements of radium will always maintain their specific order, now and ever onwards, just as they have done all along. There is, then, a statistical order in the elements.

**Tagore:** Otherwise the drama of existence would be too desultory. It is the constant harmony of chance and determination which makes it eternally new and living.

**Einstein:** I believe that whatever we do or live for has its causality; it is good, however, that we cannot look through it.

To summarise, then, we can discern three philosophical attitudes towards the relationship between man and Nature arising from the Einstein-Tagore conversations. The first, held by Einstein, is that Nature exists, objectively, whether we know it or not. The second, held by Bohr, is that the objective existence of Nature has no meaning independent of the measurement process. The third position, held by Tagore, is more complex. Tagore says that Nature can be conceived only in terms of our mental constructions based on what we think we perceive and that there exists a universal mind.

Einstein went on worrying at the “reality question” until the day he died; so, less conspicuously, did Tagore. Neither came to a definite conclusion. All three viewpoints have adherents throughout science today and it will be interesting to see how the balance alters as science changes: will Prigogine’s prediction – that science is evolving according to Tagore – come true? **R**

This is an edited version of an article that first appeared in the *Times Higher Education Supplement* (THES) in 1995.

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