



Albert Einstein – an icon of the 20th century – some myths

Zofia Gołab-Meyer

*Marian Smoluchowski Institute of Physics
Jagellonian University, Cracow, Poland*

Albert Einstein is one of the icons of the 20th century. He is also considered one of “twelve men who were inflaming women with desire, because they sacrificed love for a higher cause, and men with jealousy, because of their passion, fame, wealth and skills of seducing” (description from a popular journal). Among those twelve there was only one scientist. Indeed, in terms of popularity Einstein matched the greatest stars of cinema and sport. He became one of the symbols of the 20th century. His face is recognized even by children in remote corners of the world.

The 20th century abounded with prominent physicists who changed the face of physics. Einstein occupies an extraordinary position among those greats.

Having established the general theory of relativity, he became one of the three greatest physicists in history. Newton, Maxwell and Einstein form this great trio.

Einstein’s status as an icon of the 20th century is well justified, but the public has not really appreciated the significance of his discoveries. Einstein became a legend during his lifetime, but a number of incorrect ideas about him have contributed to the rise of his legend.

It is not true that Einstein was engaged in physics “for only twenty years”, and that “the rest of his life he devoted to music, family, and social activities in aid of peace.” **The entire sense of Einstein’s life was physics.**

And, even though it is true that (what has been awkwardly named) “The Special Theory of Relativity” (1905) was about to be discovered by other scientists (H. Poincaré and others were close to a similar discovery), it was Einstein who clearly formulated the theory, thanks to his extraordinary intuition. Yet, it was not for this theory that he was awarded the Nobel Prize. He received it for his explanation of the photoelectric effect.

Einstein’s greatest achievement, the one that elevated him to the top rank among physicists, is general relativity, which is the theory of gravitation in relation to the geometry of physical space and time. At the time of its discovery, this theory could not be anticipated from any experiment or physical phenomenon. Formulating such a theory required great intellectual courage and effort. Having developed it, he was so confident that he pretended to be disinterested in the results of the only measurements that were possible at the time to prove the theory (Eddington’s observations of the deflection of starlight during a solar eclipse.)

Nowadays, although not many people are aware of it, Einstein's theory is used in global positioning systems. The precision of GPS is contingent upon calculations which have to include the effects of general relativity.

After the discovery of this theory Einstein started to work on another problem, one which has not yet been solved: the unification of gravitational interactions with other interactions. In order to understand the meaning of the unification of interactions, it is worth recalling a few facts from the history of physics. By formulating the famous law of gravity, Newton unified phenomena that take place on the earth (falling objects) and ones in space (the movement of planets). Maxwell is included into the great trio because he ultimately unified electric interactions with magnetic interactions. Today we understand that the force which attracts dust particles and creates thunderbolts originates from the same interaction that determines the position of a magnetic needle. This "electromagnetic interaction" also enables us to generate and receive radio waves, and we now know that light is also an electromagnetic wave. Einstein recognized the need for the unification of the fundamental interactions and spent the rest of his life on this problem. He failed to solve it. Important experiments were conducted in later years, after the nature of all interactions had been better understood, but the road towards a successful solution of the unification problem is still ahead of us even though success has been achieved in unifying the electromagnetic interaction and the so-called weak nuclear interaction. Numerous groups of prominent physicists have been working on this problem for many years. Einstein worked alone.

Pondering the physical problems, that one in particular, and physics in general (Einstein was also a philosopher) filled Einstein's life. He joined the peace movement not because of his keen interest in social activities, but because of a sense of obligation. He was well aware of his popularity and the authority he enjoyed. He used his image for the purpose of propagating pacifism. After World War I, he was severely criticized for his pacifistic ideas. He was one among innumerable intellectuals in Europe who had been seduced neither by nationalistic ideals nor by communism. He was a super-intelligent individualist, with his feet firmly on the ground.

Einstein, like every famous person, was extremely popular among women. Quite possibly, he occasionally might have taken advantage of this. Nonetheless, he reserved his emotions only for physics.

He was neither a perfect husband nor a perfect father. The primary thing he expected from family life was absolute quietness. His first marriage, to his university friend Mileva Marič, did not stand the trial of time. Many unfavorable circumstances contributed to its failure: a premarital child (a girl) who had been given up for adoption, a poor financial situation and a family life that had been interfering with his intensive thinking about physics. Two children (boys) and a neurotic wife in a poor household certainly must have distracted the genius from

his work. Perhaps he was happy to escape to the comfortable and *petit bourgeois* house of his remote cousin Elsa.

It seems that the long-lasting relationship with Elsa could only have worked because she created for him a comfortable asylum that kept him away from mundane matters. It is hard to say what kind of happiness Einstein found in this relationship. Most likely he did not search for it; Elsa said nothing about it. Was she happy? She was not very young when she married Einstein. She had the opportunity to understand him well and she accepted her role. Einstein donated his Nobel Prize to Mileva, his first wife, not to get rid of the problem and preserve his good image (he was already a public person); he was truly concerned about her and their sons (one of them had already been showing serious symptoms of a mental illness).

While he had been able to enjoy intellectual conversation with Mileva (though it is not true that she allegedly contributed to the discovery of the special theory of relativity), in this respect Elsa was not a match for him. Among other women who were absolutely devoted to him was Helen Dukas, his perennial secretary and later a warden of his heritage. Einstein was also close to his sister Maia and stepdaughter Margot. However, it seems he never considered women as equal partners. Undoubtedly he felt respect for Maria Skłodowska-Curie and there was a sort of friendship between them.

Einstein did not exchange many letters with women. He put correspondence from his numerous fans, often well-known women, into a special box for letters from cranks. Hence, his exchange of letters with the wife of a great physicist, Max Born, were exceptional; the two of them discussed various ethical problems.

Until the end of his life Einstein was an active physicist and philosopher. Like many other famous physicists of the time, he enjoyed relaxing with music. And in the way he performed physics he was like a great artist.

The story that Einstein was allegedly a poor student and that he had problems in school is unproven. He showed his talents very early. As a high school student, he demonstrated great independence of thought and opinion. At that time he clearly showed his aptitude for mathematics and his passion for science. He already had a deep interest in philosophy and literature. He was, however, poor at foreign languages. He did not believe in wasting time on things he didn't like.

Unlike young Smoluchowski in Vienna, who had been lucky to be introduced into physics by Hoefler, Einstein did not find such a tutor and mentor in the Leopold's High School in Munich. Yet his teacher in Munich recognized his great talent and let him organize his course of study individually. This was quite unusual for a German school known for its strictness, but how can we blame a teacher who could not match his genius student?

Einstein did not like Munich and eventually he moved to Switzerland to a modern school in Aarau, where he could catch up on his education. Without

protest he subjected himself to the school discipline. He managed to do this relatively easily, as he established peer friendships, which are so important for maturing men.

As physicists, we are glad it turned out that capricious public opinion made Einstein an idol of the 20th century. And even though we have to tolerate the fact that his image diverges from reality, we can strive to learn the truth about the person he was.



Mileva and Albert Einstein (1903) [*Physics Today*, Sep. 1994, p. 38]

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