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A brief biography of Albert Einstein

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“Very few characters of the 20th century, including those politicians or humanists who in life were adored by the general public, will have had the honor of being honored to such an extent by their contemporaries” [1]. Albert Einstein is one of the most famous scientists in history, known for his groundbreaking theories of relativity and quantum mechanics. When Einstein left Germany, fleeing Nazism, he was already a legend. In the last years of his life, he received thousands of letters and queries on the most varied topics, not only scientific but also philosophical and humanistic. Although Einstein himself could not explain why he had become a media figure, the obvious reason was that Einstein was a scientist particularly sensitive to socio-political problems, with a humanist thought. “This other aspect of Einstein's life and work, that of freethinking, is not always emphasized as it should be. But after time, when the effort is made to calmly reconstruct what his ideas and opinions were about war and peace, about the human condition, about science in its history, about the responsibility of the scientist at the time of weapons of mass destruction, about education, about religion, about Judaism and socialism, it is better to understand that attraction that the man Einstein produced and that he always considered a mystery” [2].

Albert Einstein was born on March 14, 1879 in Ulm, Germany, and died on April 18, 1955 in Princeton, New Jersey, United States. His parents were Hermann Einstein and Pauline Koch, Jewish merchants dedicated to the distribution of water and gas and later to an electrical material factory. He had a sister named Maja and a brother named Heinrich. His childhood was spent in Munich, where he began his primary studies at the Luitpold Gymnasium where he excelled in mathematics and physics. He also liked to play the violin, probably motivated by his mother who was a pianist. Between 1888 and 1894, at the same Luitpold Gymnasium, he continued his secondary studies, standing out in mathematics and a little less in humanities, although his grades were always good. The legend that Einstein was a bad student is false according to the documents that have been preserved [3].

He later attended the Swiss Federal Institute of Technology (ETH) in Zurich from 1896 to 1900 [4] and graduated with a degree in physics. The same year that he entered the Zurich Polytechnic, he renounced his German nationality for the first time. In a manuscript entitled "My projects for the future", which he wrote in French at the age of sixteen, Einstein explains that he wants to enroll in a career to be a professor of mathematics and theoretical physics, because in the scientific profession there is a certain independence that he likes, while, instead, he believes he lacks fantasy and practical aptitudes” [5]. He had as a mentor and professor of physics Heinreich Friedrich Weber (1843-1912) and as a professor of mathematics Hermann Minkowski (1864-1909), known for his theory of four-dimensional space-time and his mathematical presentation of the theory of special relativity. [6]. In 1898 he met Mileva Maric (1875-1948), a mathematician of Serbian origin, beginning a professional and loving relationship that culminated in marriage in 1903 despite the opposition of Einstein's parents.

In 1900 he finished his degree in physics and mathematics at the Zurich Polytechnic and tried to obtain an assistant position at the university to continue his doctoral thesis, but without success. In 1901 he obtained Swiss nationality conditional on obtaining a permanent job. Not even H.F. Weber helped him obtain a position as university assistant, something that Einstein would remember bitterly: "The professors did not like me because of my independence, so they put me aside when they needed an assistant" [7].

In June 1902, Einstein obtained a relatively decent job at the federal patent office in Berne, which gave the newly formed family some necessary financial stability, very opportune, since in February of that same year he was born in Vojvodina, the first daughter of Albert and Milena who was named Lieserl. Even the birth of Lieserl did not overcome the opposition of Albert's parents, and the couple were only able to marry until after the death of Hermann Einstein, who gave his son his consent to the wedding virtually on his deathbed, in the autumn of 1902. In May 1094, the first son of Albert and Mileva, Hans Albert, was born; in 1910 they had a second son, named Edward. It was not a happy marriage and they ended up divorcing, legally, in 1919.

Einstein worked at the Swiss Patent Office from 1902 to 1909. He himself recalled years later that this work was very useful for the development of his research and for establishing relationships with contemporary scientists such as Alfred Kleiner (1849-1916) who directed his doctoral thesis [8], Max Plank (1858-1947) and Arnold Sommerfeld (1868-1951) [9]. In those years, Einstein published several articles in the journal Annalen der Physik on thermodynamics, the production and transformation of light, the movement of particles suspended in liquids at rest, and the electrodynamics of bodies in motion. In particular, in one of them, he would lay the foundations of what would be called the theory of special or restricted relativity [10]. In 1908, three years after he published the paper on special relativity, Einstein was just a contract professor at the University of Bern, but by 1909, after leaving his post at the patent office, he was already an associate professor of theoretical physics. in Zurich and that same year received a first academic distinction in Geneva. In 1911 he was appointed Professor of Theoretical Physics at the Karl Ferdinand University in Prague. In 1912, he was proposed for the first time for the Nobel Prize in Physics [11].

En 1914, Einstein era ya miembro de la Academia Prusiana de Ciencias, catedrático de la universidad de Berlín y había sido propuesto por Max Plank como director del proyectado Instituto de Física de la Kaiser-Wilhelm Gesellschaft; todo lo cual, le facilitó el contacto con los eminentes físicos de la época como Marie Curie, Poincaré, Rutherdford, Langevin, Plank y Lorentz. Si su traslado a Praga y luego a Berlín resultaron un espaldarazo académico las circunstancias políticas de esos países no eran las más favorables. Familiarmente, el cambio tampoco fue favorable. Finalmente, en 1919 se divorcia de Mileva Maric y se casa con su prima Elsa Löwenthal, con la que estaba conviviendo desde hacía dos años [12].

In 1914, the other Einstein, not the scientist, but "the Einstein who, in addition to conversing with divinity (and with Besso and Grossmann) about the structure of the laws of the universe and manifesting himself incapable of resolving minor and serious matters of everyday life, he cares about the situation of the human zoo and intervenes in it" [13] is increasingly shown: he opposed the manifesto addressed to the civilized world by German intellectuals that justified the actions of the German army on behalf of the defense of culture; gave his signature to another pacifist and Europeanist Manifesto that deplored the war; he accentuated his anti-war demonstrations; applauded the beginnings of the revolution in Germany, in 1918, as a step towards the demilitarization and democratization of society. At the end of 1918, Einstein wrote to Michele Besso: "I have the reputation of an irreproachable socialist; consequently, the heroes of the day before come to salute me, believing that I can prevent their fall into the void. What a people!" [14].

At the end of the First World War, during the eclipse of May 29, 1919, Arthur Eddington, professor of astronomy at Cambridge, and Frank Dyson, astronomer royal, made observations in Sobral (Brazil) and on the island of Príncipe. would confirm one of the predictions of the theory of relativity. In November 1922 it was announced that the Nobel Prize in Physics corresponding to the year 1921 would be awarded to Einstein for his contributions to Theoretical Physics, especially for his discovery of the law of the photoelectric effect. After revolutionizing physics, it seemed clear that Einstein would one day be awarded the Nobel Prize. However, it is shocking that this recognition took so long to arrive and that it was awarded especially for his discovery of the photoelectric effect. To explain

this effect, Einstein postulated that light is transported in tiny packages, thus providing a very important element that would contribute to the development of quantum physics. The introduction of this revolutionary concept is in itself enough merit to receive the prestigious award, although it seems strange that the Nobel Committee did not take the opportunity to recognize the greatest of its contributions: introducing a radical change in the way we conceive space, time and energy.

The first Nobel nomination for Einstein came in 1910 from Wilhelm Ostwald (1853-1932), who placed particular emphasis on the fact that the theory of relativity was concerned with the most fundamental physics, and not, as claimed by his detractors, with mere philosophy. From 1910 to 1921, Einstein was nominated 62 times to receive the Nobel Prize, the vast majority of times for his Theory of Relativity, however, he never got the prize for it. Einstein's candidacy was always opposed by at least one member of the Nobel Committee for Physics: Allvar Gullstrand (1862-1930). Some of the reasons given by that committee for rejecting Relativity were: "Your work is not useful enough for the human race"; “We should wait for measurable evidence”; “The effects of Special Relativity that can be measured are so small that they fall within the limits of experimental error”, or “The Theory of Relativity has more of an article of faith than a scientific hypothesis”. In 1921, when empirical evidence perfectly confirmed the Theory of Relativity, Einstein's Nobel nomination was again rejected by the Nobel Committee for Physics. However, at that time this theory was already so well-known and accepted by the majority of scientists that the legitimacy of the Nobel Committee for Physics was called into question. In fact, that year the Physics Section of the Academy of Sciences rejected the proposal of the Nobel Committee and proposed Einstein to the Academy of Sciences to receive the Nobel. Gullstrand, very angry about that decision, wrote two letters to all the members of the Academy with the purpose of convincing them that Einstein should not receive the prize. Ultimately, the Academy decided to postpone its decision, and in December 1921, the Nobel Prize in Physics was left unassigned. The Swedish physicist Carl Wilhelm Oseen (1879-1944), who joined the Nobel Committee for Physics in 1922, had become aware of the problem and had nominated Einstein in 1921 and 1922 for the photoelectric effect. Finally, in 1922, Einstein's candidacy was accepted to receive the 1921 Nobel Prize in Physics for "his services to Theoretical Physics, and especially for his discovery of the law of the photoelectric effect." At that time (December 1922) Einstein was invited to Japan to explain his theory of Relativity and I cannot collect the prize. Months later, in July 1923, Einstein went to Stockholm to collect the prize for the photoelectric effect. There he delivered an acceptance speech that had nothing to do with said effect, which was entitled 'Fundamental Ideas and Problems of the Theory of Relativity'. Undoubtedly, the speech that most attendees expected and wanted to hear [15].

After the Nobel Prize in Physics was awarded, Einstein visited Paris, London, Japan, Spain, South America, Belgium and the United States [16]. In 1924 he accepted Prussian citizenship, although he retained Swiss nationality. In 1928, he was diagnosed with a dilated heart. Einstein continued with his scientific work, writing several articles on quantum theory and on what since 1928 he called unitary field theory (Einheitliche Feldtheorie) [16]. In 1933 Einstein understood that the rise of Nazism in Germany was preventing him from following his pacifist program, that it was going to be necessary to confront it. He advocated the formation of an international court and a supranational police force [17]. Fearing for his own integrity, in the fall of 1933 Einstein emigrated to the United States to settle at the Institute for Advanced Study in Princeton, as a visiting professor. Although he was received by the President of the United States himself, he was warned to keep silent on non-scientific issues and to refrain from participating in public events. Due to this warning, Einstein's public appearances were considerably reduced from 1935 to 1939, although he did not stop facing the barbarism that was coming, and even came to openly support the American League Against War and Facism, an anti-militarist organization. and anti-fascist whose most active members were communists [18]. His confrontation with the Spanish intellectual Ortega y Gasset was also notorious because of a message from Einstein to the International Congress of Writers, in July 1937, supporting the Spanish Republic during the civil war; as well as the letter addressed to Roosevelt, in 1939,

drawing the attention of the North American president about the possible military use of atomic energy [19].

President Roosevelt replied to Einstein's letter, informing him that he had decided to appoint an advisory committee on the use of uranium, chaired by Lyman j. Briggs, head of the Bureau of Standards. The first meeting of this advisory committee was attended by its president, the military Adamson and Hoover, and the scientists Sachs, Szilard, Fermi, Wigner and Teller (but not Einstein) [20]. In 1940, Einstein was again invited to participate in a meeting, but he declined [21], leaving what would become known as the Manhattan Project, led by General Leslie R. Groves. The documentation known up to now allows us to ratify the opinion formulated at the time by Otto Nathan and Heinz Norden, two people who knew Einstein well and who dealt with him frequently in his last two years: his role in the process that was to lead to the bomb atomic energy was perhaps decisive when it came to attracting the attention of the North American president, but it was minimal when it came to carrying out the project [22]. At the end of 1945, Einstein wrote: “I do not consider myself the father of nuclear energy. My involvement in this has been very indirect. In fact, I never thought [the pump] would be used in my lifetime. I only believed in the possibility, in theoretical terms” [23]. At the end of his life, in March 1955, Einstein went a little further: “If I had known that my fears [about the development of atomic energy in Germany] were unfounded, neither I nor Szilard would have helped to open this Pandora's box. , because we didn't just mistrust the German government” [24].

Einstein hoped that atomic weapons would never be used, so their use on Hiroshima and Nagasaki were a blow to his pacifist mentality. He reacted as at the end of the twenties, intervening very actively in political and social affairs in his last ten years of life (1945-1955). His main concerns were the social responsibility of scientists with respect to the nuclear industry, the denunciation of armaments, the criticism of militarism and the militarization of political thought, the demand for an operational world government that would make up for the deficiencies of the United Nations, the recovery of the old idea of conscientious objection and its extension to civil disobedience with a Gandhian orientation, the defense of a new way of understanding political issues and intervention in the problems of the polis [25]. We can see in Einstein's interventions dangerous formulations in a world still dominated by colonialism, such as the proposal for a world government, but his attitude was always against the warlords and US foreign policy; so much so that the ultraconservatives have always violently attacked him since the end of the war, accusing him of being a communist and even a Mississippi congressman asked that he be prosecuted [26]. Regarding the forms of government, Einstein continued to consider democracy as his own ideal, but clarifying that he was thinking of a democracy that would complement the liberal political body with some of the socio-economic demands of the socialist tradition [27].

The discomfort of some scientists who had participated in the Manhattan Project, and others who without having participated had reached the same conclusions, led to the formation of the Emergency Committee of Atomic Scientists, in 1946, chaired by Albert Einstein. The objectives of the Committee were: to educate public opinion about what atomic energy really represented, to promote its use for the benefit of humanity, to broaden the awareness of scientists about the risks of the militarization of science, to combat secrecy in the research and promote the idea of international cooperation among scientists [28]. In 1948, the Committee accepted Einstein's ideas in favor of a world government and dissolved within a few months. Einstein insisted, and in an article, he wrote for the UNESCO Courier in 1951, he proposed the form of a world federation.

In late 1948, Einstein was diagnosed with an abdominal aortic aneurysm and spent several weeks in the hospital. In 1950 he made a will naming Otto Nathan as executor and he and his secretary, Helen Dukas, administrators of his assets. In 1952, his sister Maja, with whom he had lived since 1939, died, causing him great sadness. He rarely went out and barely appeared at public events. In his last

years, in addition to insisting on a world government, Einstein opted for the defense of socialism as an alternative to the economic anarchy of capitalist society; the reiteration of Gandhian forms of struggle; and the affirmation of the need for an ethical culture to guarantee the survival of the human species in the nuclear age. On the first point, Einstein published an article in the well-known Monthly Review magazine entitled Why Socialism? [29].

At the beginning of 1955 Einstein suffered from anemia, but he did not stop working. At the Princeton hospital, where he was admitted as an emergency, he continued with his equations and calculations. He corresponded with the contemporary philosopher he most appreciated: Bertrand Russell. From that relationship was born his last important intervention in public affairs. On February 11, 1955, Russell proposed that he led a statement against nuclear weapons. Einstein agreed and proposed a public statement signed by prestigious scientific personalities advancing the names of Niels Bohr and Leopold Infeld. A few days before his death, he received the text written by Russell and signed it. On April 18, 1955, Einstein died as a result of a ruptured aortic aneurysm. The greatest scientist and rebel of the 20th century had died, who wrote of himself: "To punish me for my contempt for authority, fate made me an authority myself" [30].

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