
Einstein as a Celebrity

The Eclipse Expedition:

Einstein's primary paper on general relativity was published in 1915, but did not become accepted among physicists for several years, as direct experimental confirmation was not available. An eclipse in May of 1919 would present the opportunity to test the theory, by measuring the angular displacement of stars close to the sun compared with non-eclipse photographs, but it seemed unlikely at first that any tests would be carried out. During World War I, deep resentment between Britain and Germany obstructed scientific cooperation between the two countries. This resentment was widespread among intellectuals and scientists in addition to the population at large: the British elite saw the German "Huns" as inhumane and opposed to culture, while Germans were upset by these attacks on their nation. With a few exceptions, such as Einstein himself, most of the leading German and English scientists of the 1910s participated in public campaigns condemning the other side, even going so far as to suggest excluding Germany from the international scientific community. In this climate, it seemed impossible that Britain would bother using its resources to test the ideas of a German theoretician. Another chance at testing general relativity would not come about for several more years.

The eventual British-led eclipse expedition was the work of Arthur Stanley Eddington, an astronomer well-known for his work determining stellar structure. Eddington was a Quaker who objected to the violence of the war and the dehumanization of Germans. During and after the war, English Quakers had travelled to Germany to provide material aid to the suffering country and reaffirm the common brotherhood of humanity. Eddington, who identified with Einstein's pacifism and antimilitarism, saw the eclipse test as a Quaker mission within the scientific community, creating new bonds between Britain and Germany and restoring the international spirit of astronomy. He argued continually for relativity's importance among fellow astronomers. Many objected that gravitational deflection and optical refraction would be indistinguishable and that the expedition to the eclipse's path (which crossed Africa and South America) would be an expensive waste of time. However, Einstein's explanation of Mercury's precession intrigued enough astronomers that Eddington was able to win support and carry out the plan.

The expedition consisted of two observational teams: Eddington lead a group to Principe off the coast of West Africa, while another went to Sobral, Brazil. Despite some bad weather, the Principe group was able to get enough plates to confirm a deflection. The Sobral group showed a smaller deflection, but their photographs were of much worse quality. A last-minute auxiliary camera in Sobral ended up getting the best results out of the entire expedition. After analysis, Eddington decided on a mean deflection of $1.64''$, in comparison with the prediction of $1.75''$. A rumor has persisted that Eddington discarded or ignored the worse results in his excitement to confirm general relativity, but this is not substantiated. He was honest about the poor quality of some of the photos and described the expedition as a tentative initial test. In the November 6, 1919 presentation of the results by the Royal Astronomical Society, Eddington claimed that he had confirmed Einstein's prediction (though not necessarily his theory) and called for further testing. The astronomers present generally agreed that Einstein's quantitative predictions held but that his explanation was still open to questioning.

The public reaction was much stronger. *The Times* issue of November 7 famously proclaimed a “revolution in science,” and other newspapers made similar claims over the next days and weeks. The press portrayed relativity as one of the greatest achievements in human thought and claimed that Einstein had knocked Euclid and Newton off their pedestals. This popular obsession with relativity was partly the result of the dramatic eclipse test, but also of the nature of the theory. Unlike quantum theory, which never became such a fixture in popular thought, relativity took simple, everyday concepts and rearranged them in seemingly paradoxical ways. Although non-scientists could not understand the mathematics behind general relativity, they latched onto ideas such as length contraction, extra dimensions, a finite universe, and the curvature of space (if not the curvature of spacetime) that seemed to belong in *Alice in Wonderland* rather than the usually inaccessible world of physics. This degree of public engagement is rare in the history of science; similar examples include Darwinian evolution or Freudian psychoanalysis.

Einstein’s Fame:

A distinction should be drawn between the fame of relativity, which was well-established by the 1919 headlines, and the fame of Einstein, which developed more slowly. This was especially important in America, where the concept of the individual celebrity was strongest. Before Einstein’s first visit to the U.S., in 1921, public feelings toward relativity were more fearful and distrustful than elsewhere. This was a time when Americans were more interested in stability and continuity than new ideas of the universe: in the aftermath of the Russian Revolution and among widespread labor unrest at home, Americans were not willing to accept another “revolution” that would upset the established order. The *New York Times* went so far as to proclaim that Bolshevism was invading science. Furthermore, Americans were struck by the difficulty in understanding general relativity: a common claim was that “only twelve people in the world understood it.” The idea of obscure science that only an elite few could understand seemed to undermine the American ideal of common-sense democracy. The general sense was that an elite few (probably all foreigners) had the power to rearrange space and time or even destroy gravity.

These feelings quickly passed once Einstein arrived in America. His first trip in April 1921 was actually part of a campaign to raise support for Zionism. His party, consisting of several prominent Jewish intellectuals (including Chaim Weizmann, a biochemist who later became the first President of Israel), received a warm welcome from New York’s Jewish community. While this excitement was directed toward the group as a whole, the mainstream press interpreted it as a “hero’s welcome” for Einstein. This initial reception helped to remove much of the fear surrounding the mysterious physicist, as anyone receiving a hero’s welcome had to be worth welcoming. In addition, Einstein’s personality was well-received in America. The press expected a pompous, aloof European intellectual who looked down on America’s lack of culture. Instead, Einstein was modest, witty, and informal. America first saw Einstein in pictures revealing his ill-fitting clothes, charming smile, and habit of smoking pipes. Unexpectedly, Einstein’s reception and personality resonated with Americans and paved the way for his celebrity status.

Later Legacy:

Instead of fading out as a fad, Einstein has remained a fixture in the public consciousness since the initial media storm of 1921. He has acquired an almost religious connotation as a secular saint embodying the abstract concepts of genius and reason. The press exaggerated his

distance from common people, emphasizing that his theories were incomprehensible to the average person and creating a mythology around the physicist. He happened to become famous at the moment when the mass media was coming into being, giving the world easy access to pictures and quotes revealing his unconventional personality. Although Einstein never particularly enjoyed his media attention, he accepted it and maintained friendly relations with the public. Public opposition to Einstein has been scarce, mostly coming from anti-Semites who rejected him on principle rather than because of his theories or personality. This anti-Semitism was most famous in Nazi Germany, although undercurrents of it persisted in America and elsewhere.

One important shift in Einstein's legacy came in the aftermath of World War II, which reinforced the connection between science and destructive weaponry in popular thought. In particular, nuclear weapons, as the symbol of science-gone-too-far, became connected with Einstein and his mass-energy equivalence formula (see *Time* cover in bibliography under Baker). Einstein himself was largely unconnected with the bomb's development and did not realize the possibility of nuclear weapons when he first published his 1905 papers. Nevertheless, the misconception of Einstein as the creator of the nuclear bomb transformed his image into that of a tragic figure, pushing for international peace while unintentionally paving the way for horrible destruction. During the Cold War and after, the public perception of science changed: instead of representing humanity's progress and betterment, science was now a double-edged sword that, if not controlled, could bring disaster to a society unprepared for its consequences.

Influence on the Arts:

Over the first several decades of the twentieth century, contemporaneously with the development of modern physics, widespread experimentation flourished in art, literature, and poetry. It is possible to draw a connection with these modernist artists and Einstein, although this should not be overstated. It would not be fair to claim that relativity was the cause of this experimental mood, as it had already begun before 1919 and Einstein's widespread fame. However, direct references to both Einstein and modern physics makes it tempting to find parallels between contemporary shifts in art and science.

Some modernists drew connections between their work and Einstein's. One prominent example is William Carlos Williams' 1921 poem "St. Francis Einstein of the Daffodils" portrays the physicist as a rebellious liberator bringing new life to a dead world of old-fashioned knowledge. The poem reflects a general mood that advances in physics had opened up new possibilities for intellectual exploration in other areas. A similar mood is found in Archibald MacLeish's "Einstein," published in 1926, which follows the physicist's efforts to break free from conventional modes of thought and obtain a truer understanding of the universe. In a sense, Einstein provided validation and inspiration to these poets: they were following in his footsteps by breaking down conventional barriers in order to reveal deeper truths. In a world transformed by modern physics, modern artists felt compelled to keep up and adapt.

Other modernists incorporated relativistic concepts into the form of their works. The Cubist painter Pablo Picasso, who spent time with scientifically-educated peers and thus may have been exposed to relativity early on, broke with the tradition of linear perspective that had long been central to Western Art. He instead portrayed the same subject from multiple perspectives simultaneously or overlapped drawings of the same subject at different points in time. This does not directly imply an influence from Einstein, his confusion of the separation between space and time reflects relativistic ideas. Similarly, authors experimented in telling the same story from multiple perspectives (such as Virginia Woolf's *The Waves* or James Joyce's

Ulysses) or out of chronological order (such as William Faulkner's *The Sound and the Fury*). These techniques were not new to the modernists, but they became more prominent and disjointed in this period. Instead of different perspectives being used to reinforce a single master narrative, writers in this period emphasized the lack of a complete picture—there was no preferred frame of reference. Some of these authors followed scientific developments and directly referred to relativity, but it is unlikely that most understood the mathematical details of the theories.

Relativity's relationship with philosophy and morality was often misunderstood in the 1920s. Many mistook the theory as implying moral relativism or suggesting that all viewpoints and opinions are equally valid. The philosopher José Ortega y Gasset enthusiastically incorporated relativity into his own philosophical system, perspectivism, arguing that non-Western perspectives are just as correct as Western ones and that other cultures should not be dismissed as barbaric or uncivilized. Regardless of how sympathetic we might be to this view, it has nothing to do with the actual theory of relativity. Others saw the moral ambiguity supposedly implied by Einstein less favorably: poets such as E. E. Cummings lamented the new direction of science, seeing it as dehumanizing, amoral, and undermining the mystery of religion. A more moderate position was that advances in physics were alright as wrong as they were not misunderstood and applied to ethics.

Key Ideas:

- Based on the modern myth of Einstein, many aspects of his life and personality seem to contradict each other: he was approachable, yet his theories are beyond comprehension; he fought for peace while inadvertently aiding the war effort; he represents the triumph of reason, yet was often shown expressing himself on the violin. These contradictions are, in many cases, the result of misinterpretations of his theories or distortions by the popular media. They often reveal more about society's contradictory attitude toward science than the reality of Einstein's life.
- No other physicist in history, even Newton or Galileo, comes close to Einstein in terms of popular recognition. Part of Einstein's fame comes from the genuine importance of relativity to modern science, but he was helped by coincidences and lucky happenings such as the timing of the 1919 eclipse and his reception in America's Jewish community. Had events turned out differently, Einstein would certainly have remained a highly-respected physicist, but it is interesting to speculate whether he would have achieved legendary status without help from luck.
- Einstein entered the popular culture at the moment when the modern celebrity ideal was taking shape. In this sense he might be compared to figures such as Charles Lindbergh or Charlie Chaplin. Earlier scientists such as Charles Darwin or Louis Pasteur had become well-known to laypeople, but did so without the mass exposure made possible by modern media. Later in the 20th century, scientists such as Carl Sagan or Stephen Hawking achieved celebrity status through the use of popular media, often acting as popularizers of science or explaining theories to a general audience. Einstein does not exactly belong to either group, marking a transition point in how physicists were viewed by society at large.
- The relationship between scientific advance and artistic experimentation is not a simple case of cause and effect. It is fair to say that the two existed in the same intellectual atmosphere of the early 20th century and that experimental artists were aware of relativity, even if they did not understand it. However, given how tempting it is to draw

interesting connections between art and science, it is important to be cautious when direct evidence of a relationship is not available.

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