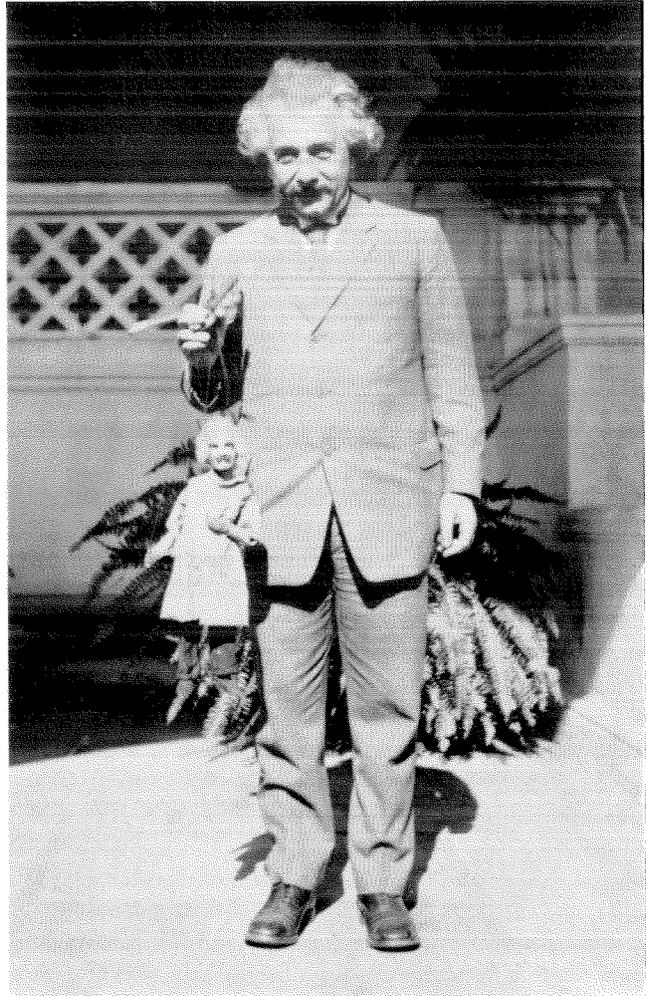


Albert Einstein in California

by Judith Goodstein

He was welcomed with a mix of
show business, hero worship
and real affection



Two Einsteins in front of the brand-new Athenaeum in 1931 — Albert himself and a puppet from the play called *Mr. Noah*. Albert said the puppet was “good but not fat enough.”

In the annals of 20th-century science, 1905 was a vintage year because in that year Albert Einstein, Technical Expert (Third Class) in the Swiss Patent Office, published four papers in the prestigious *Journal of the German Physical Society*. One dealt with the motion of particles suspended in a stationary fluid — popularly known as the theory of the Brownian motion. A second paper dealt with the nature of light, and the ideas embodied in this piece of theoretical research — more commonly known as the photoelectric effect — ultimately earned the author a Nobel Prize. The third paper discussed the electrodynamics of moving bodies, and those ideas soon became known as the theory

of special relativity. And the fourth paper dealt with the relation between the inertia of a body and its energy content, which can be summed up in the equation $E=mc^2$.

The ideas in those four papers ushered in a new era of theoretical physics. In fact, Robert A. Millikan liked to say that even if Einstein had never published a word on relativity, his other papers of 1905 and his subsequent discoveries in radiation theory and statistical mechanics would have won him an enduring place in the history of ideas.

Fortunately, Einstein did think, write, and publish on the subject of relativity. In fact, he spent eight years transforming his special theory of relativity into the more com-

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prehensive general theory of relativity. He began toying with the problem of incorporating gravitation into the special theory in 1907, and in 1916 published the fundamental paper on general relativity.

The theory of general relativity made a number of predictions, one of which — the bending of a ray of light in the vicinity of the sun — was confirmed by two astronomical expeditions in 1919. That confirmation, almost single-handedly, turned Einstein the theoretical physicist into a 20th-century folk hero. From then on until his death 36 years later, wherever Albert Einstein traveled, throngs of people gathered around him.

In the early 1930's he came to California specifically to consult with scientists at the California Institute of Technology. Few members of the general public understood the nature of his visits, but they idolized him all the same. From the moment his boat docked in San Diego on December 31, 1930, the reception accorded him by Californians was one part show business, one part hero worship, and one part genuine affection. Groups of children dressed in blue and white middies serenaded him and thrust wreaths of flowers into his hands, two bands struck up tunes, and in Los Angeles a theatrical group, the Yale Puppeteers, opened a play called *Mr. Noah* in which the ark landed on Mt. Wilson instead of on Mt. Ararat. After its landing, the script called for Mr. Einstein to come out of his office to see what was going on. Einstein himself agreed to attend a private performance of the play, and afterwards examined the puppet of himself, remarking that it was "good, but not fat enough." He then took from his pocket a letter addressed to "Lieber Albert," made a wad of it, and stuffed it up under the smock of the puppet.

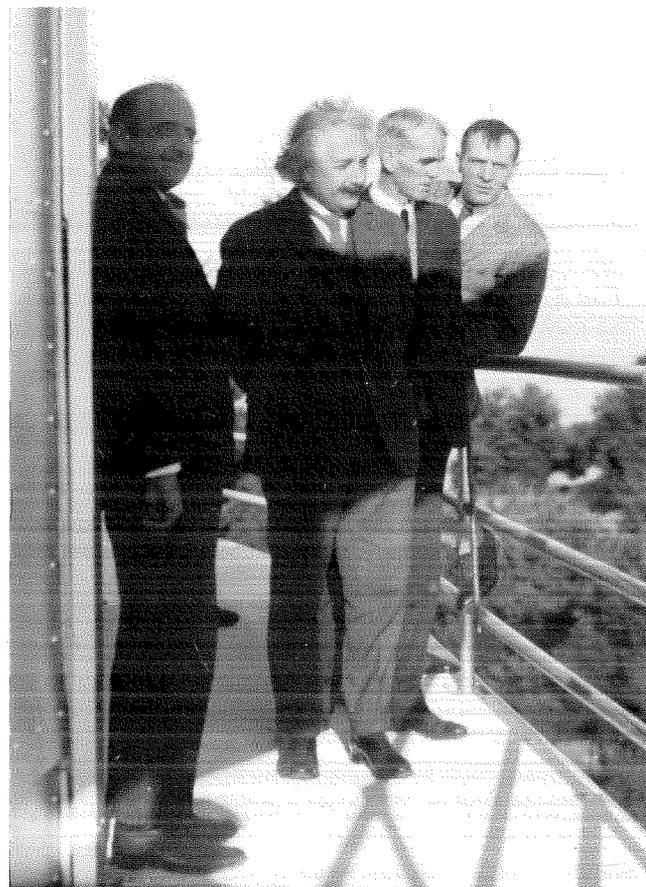
Will Rogers, the noted humorist, really described the whole sideshow when he said just after Einstein returned to Berlin in March of 1931: "The radios, the banquet tables and the weeklies will never be the same. He came here for a rest and seclusion. He ate with everybody, talked with everybody, posed for everybody that had any film left, attended every luncheon, every dinner, every movie opening, every marriage and two-thirds of the divorces. In fact, he made himself such a good fellow that nobody had the nerve to ask him what his theory was."

"What his theory was" was very much the point of his visits to Caltech, however. As early as 1913, Einstein was looking for experimental verification for the correctness of his theory of general relativity, and he had been in correspondence with Caltech's George Ellery Hale, asking him to make an astronomical measurement. He was anxious to know if Hale could detect the influence of the sun's gravitation field upon a light ray. Hale replied that in order to

try he needed a solar eclipse. The experiment was finally carried out in 1919 by two British expedition teams and again in 1922 by an American team of astronomers — and it did confirm the theory of general relativity.

There were cosmological implications in this theory, and they attracted a lot of attention in the 1920's and 1930's — nowhere more than at Caltech. Millikan had been urging Einstein to visit the campus for some time, and, in the fall of 1930, he agreed to spend the winter quarter in Pasadena. Not only would he be able to discuss his theory and its interpretation with distinguished scientists; he would also be meeting old friends again — Richard Tolman, the cosmologist; Paul Epstein, the theoretical physicist; and Theodore von Kármán, the aerodynamicist.

Tolman's scientific interests were varied, but the main thrust of his work at the Institute included statistical mechanics, relativistic thermodynamics, and cosmology. From its inception in 1905, Tolman followed closely the



In January 1931, Einstein and his mathematical assistant, Walther Mayer, with astronomers Walter Adams and Edwin Hubble at the top of Mount Wilson's solar tower.

development of relativity theory and its application to the problems of cosmology. Together with Gilbert N. Lewis, he published the first American account of the special theory of relativity (1909); and his introductory textbook about the theory appeared in 1917. This early interest in relativity theory, spurred on by Edwin Hubble's discovery that redshifts are proportional to distance, led to a series of studies at the Institute in the 1930's on the application of the general theory to the overall structure and evolution of the universe.

Epstein came to Caltech in 1921 from Holland, brought here by Hale and Millikan specifically to introduce the subject of quantum mechanics into the academic curriculum. Quantum mechanics was developed in two stages, and Epstein played a pivotal role in the first stage of its development. Equally important, Epstein's presence in Pasadena elevated theoretical physics to a place of prominence at the school.

Theodore von Kármán started out as a physicist and applied mathematician in Germany before embracing the field of aeronautics as well. He came to Caltech — the suggestion was Epstein's — in 1930 as director of the newly formed Guggenheim Aeronautical Laboratory.

The new Athenaeum at Caltech was the setting for many dinners to honor Einstein. At the first, on January 15, 1931, the guests included the physicist and Nobel Laureate A. A. Michelson and 200 members of the California Institute Associates. Several weeks later, a second dinner was held at which all the astronomers from the Institute and the Mt. Wilson Observatory were present. Edwin Hubble was there, as was Charles E. St. John, who verified the third prediction of the theory of general relativity. Colleagues came from Berkeley, including Tolman's close friend and co-author G. N. Lewis, who wrote to say he was coming with a friend — though not without some mildly humorous trepidation. As he put it in his letter to Tolman: "I have just accepted an invitation from Oppenheimer to drive me down. Do you think I should take out accident insurance?"

Einstein was not without a sense of humor himself. At a farewell luncheon in his honor on February 24, 1931, which was sponsored by the Pasadena Chamber of Commerce, he said: "I want to thank the extraordinary group of scholars in the fields of physics and astronomy who have afforded me glimpses of their work. They have conducted me not only into the world of atoms and crystals, but also to the surface of the sun and into the outermost depths of space. There I saw worlds which are flying away from us with incomprehensible rapidity, in spite of the fact that their inhabitants do not know us well enough to justify any such action."

To his relief, Einstein's visits to Caltech in 1932 and 1933 attracted less public attention. He and his wife, Elsa, moved into the Athenaeum for the duration of their stay, and he ventured off the campus less frequently. The purpose of his visits was, of course, the very serious one of discussing with his colleagues several scientific problems. Specifically, he was interested in the new astronomical findings concerning the redshift in distant nebulas. These observations indicated that the universe was expanding, not static, as Einstein had proposed.

How engrossing such discussions could be is indicated by a story about Einstein recently related by Charles Richter, professor emeritus of seismology. It concerned the Long Beach earthquake, which occurred at 5:54 on the evening of March 10, 1933. There had been a physics seminar that day, attended by Einstein and Beno Gutenberg, professor of seismology. The two walked back across the campus together talking mostly about Gutenberg's studies of earthquakes — and were so interested in what they were saying that they were oblivious to the fact that they were in the midst of one. When a colleague came up to them and asked, "Well, what did you think of the earthquake?" their response was, "What earthquake?"

Einstein was also deeply interested in problems of maintaining peace, particularly as they related to the rising power of Nazism in Germany. He participated in a student disarmament conference at the Pasadena Civic Auditorium, and a nationwide radio presentation on German-American relations. His first two visits to Caltech were sponsored by friends at Caltech, but his third visit, in 1933, was supported by the Oberlaender Trust of Philadelphia, in an effort to further understanding between Germany and the United States.

During this third visit, Einstein side-stepped as much and as long as possible the question of whether conditions in Germany might prevent his return to the country of his birth. After the January 30 announcement that Hitler had become Chancellor of Germany, the question could no longer be evaded. Scheduled to leave Pasadena at the end of February, he postponed his trip for a few weeks, and then went to Belgium for several months instead of to Berlin.

In the fall of 1933, Albert Einstein returned to the United States as an emigré, landing as so many had before him in New York City. From there, he went the short distance to Princeton, New Jersey, to become a charter member of Abraham Flexner's new Institute for Advanced Study and, eventually, a citizen of the United States. He died in 1955, never having returned to Germany or to Caltech. □