



John F. Benton 1931-1988



JOHAN F. BENTON, the Doris and Henry Dreyfuss Professor of History, died unexpectedly at his Pasadena home Thursday, February 25.

Born in Philadelphia in 1931, Benton attended Haverford College, earning his BA in 1953. His MA (1955) and PhD (1959) are from Princeton. After teaching at Reed College and the University of Pennsylvania, he joined the Caltech faculty in 1965 and became professor of history in 1970. Benton was honored with the Dreyfuss professorship just this past winter. He was well known in the academic world as a medieval scholar and in the local community as an active proponent of civil rights. Although Benton had suffered from arthritis for more than half his life, he never let his handicap dominate his personal and professional relationships; Benton riding his three-wheeler was a familiar jaunt sight around campus.

Benton's main scholarly interest (for more than 30 years) was the court of Champagne in the late 12th century. He combed the French archives for, and then edited, 750 charters issued between 1152 and 1197 by Counts Henry I and Henry II of Champagne and Marie of Champagne. Another long-term interest was the correspondence between the famous 12th-century lovers, Heloise and Abelard. He suggested several years ago that neither one had written the letters attributed to them but recently concluded that Abelard had probably written them all. Benton's course, "Love in the Western World" from antiquity to modern times, was an extremely popular one.

Benton was also known for his innovative application of image-enhancement techniques, developed at JPL for the space program, to make faint manuscripts legible. He suspected that it was this unusual blend of art and technology that won him a MacArthur Foundation fellowship—more than \$50,000 a year for five years with no strings attached. He was in the third year of his prize fellowship when he died.

When he won the MacArthur

award, he was quoted in the *Los Angeles Times* on why he chose to stay at Caltech: "I'm more interested in giving a sense of historical perspective to a future member of the Atomic Energy Commission than in teaching a future historian how to read documents. . . . What scientists need most is a sense of historical perspective. They can get a sense of paradigms of thought when they learn how intelligent people could have held quite different ideas in different cultures."

A memorial service (featuring the Golden Eagle Jazz Band to commemorate Benton's love of jazz) was held March 14 in Dabney Lounge. Three of his Caltech colleagues were among the speakers.

Eleanor M. Searle

The Edie and Lew Wasserman
Professor of History

My intellectual life and my joy at Caltech will be so diminished that I almost forget to be grateful that John has been around. He was a wonderful scholar and in nothing more wonderful than in his delight in the technicalities of scholarship. That's what the real fun is in medieval scholarship—the technicalities.

On the day before he died, John came into my office and said, "I've got these wonderful pictures that Peggy Brown has sent me." (They were photographs of charters of the early 12th century that had found their way to Leningrad.) "Let's go off campus," said John, as he so often did, "and have lunch." "Good," said I. "If this is a real feast, let's 'pig it' and go to Hamburger Hamlet." (This was our idea of really pigging it.) And so John and I went and we had our great lunch (hamburgers and milkshakes) and pigged it for two hours over the technicalities of those charters. How could this date have got to be this way? Who is this scribe? Is this the same scribe? We spent a wonderful two hours, and it was the essence of John—hard work and real joy. I shall always think of John in this way. He will always seem to me also to be walking that high wire that he always did walk, balancing above us with no net underneath him, with a merrily striped umbrella in one hand and charters and jokes, scattering them down upon us.

J. Morgan Kousser

Professor of History and Social Science

John Benton was a very disconcerting person. He refused to behave as one expected him to. Before I met John I hadn't known anybody very well who had been brought up as a Quaker. Even so, I had some stereotypes—moral, selfless, and most of all, solemn. John was certainly moral; he often pointed out to me issues of principle that I'd been too obtuse to see, and his activism on social questions is well known. If selfless means generous to others, generous with his time, wisdom, and concern, then John was selfless. But he was almost never solemn. For one thing, he giggled a lot, especially when he and Elspeth were together. How many times have I gone into that chaotic office of his and received a cheery, "Come on in. Do you have time to sit down and talk for a minute? Look what I got in the mail." John would then regale me for 15 minutes or so with some crazy invitation from a French committee to honor a scholar with a jewel-encrusted sword; or some obscene verses of 11th-century Icelandic songs that had only recently been translated into English; or some humorously bitter letter he'd gotten attacking him for what he'd said about Abelard and Heloise. The joy, the verve, with which he'd explain these arcane matters was very infectious. I always left John's office happier than when I'd come.

Despite all his numerous ailments, John never seemed to me to be self-pitying, and he somehow made one feel unselfconscious about his physical problems. One made allowances for his arthritis, opening the door for his three-wheeler, walking slowly downstairs; but it seemed very natural, just as one seats left-handed people at the end of the dinner table.

Among the great many emotions that flow over the survivors when a friend or family member dies is a sort of heartrent joy, a renewed inspiration from a life only now fully appreciated, the realization that, in the face of transience, we must enjoy friends and moments and not just mechanically drift through them. John Benton lived fully and joyfully, and remembering him fondly as we do, we should do so as well.

George W. Pigman III

Associate Professor of Literature

When I arrived here ten years ago John was, I believe, the very first member of the faculty to take an interest in my work and to seek me out and ask me what I was doing and show me what he was doing. Since we shared an interest in Latin literature he often shared with me manuscripts that he had found—could I help him read this little bit? And I would take my similar questions to him. He meant very much to me in turning me in a professional direction. In fact, it's appropriate that I should be speaking to you today in public because I wouldn't have spoken in public the first time without his—I won't say *gentle* urging—but urging that I give a paper at a certain conference.

I remember the moments all throughout my years here when I felt very grateful to John for his help, for his friendship. In particular I recall the many times we spent together during my first two or three years here, meeting every week to read medieval Latin poetry, which was a discovery to me because I had only read ancient poetry. Since that was the primary bond between us (and also because John and Elspeth met in a Latin class many years ago) I thought I would share with you a very brief Latin poem by one of John's favorite poets, Catullus. As a historian John was always deeply interested in the inner life of individuals in addition to broader social, institutional concerns. He was deeply moved, as I am too, by that peculiar inner vision that Catullus has. One poem that was a favorite of his is a very short poem on the death of Catullus's brother. Catullus visited the grave, which was in Asia Minor near the site of Troy, and wrote a poem about it which is very difficult to translate because it's very simple. It just says, "I've come many many miles, and I've performed this last rite, and farewell forever." And so it's my way of saying farewell to John.

*Multas per gentes et multa per aequora uectus
aduenio has miseras, frater, ad inferias,
ut te postremo donarem munere mortis
et mutam nequiquam alloquerer cinerem.
quandoquidem fortuna mihi tete abstulit ipsum,
heu miser indigne frater adempte mihi,
nunc tamen interea haec, prisco quae more parentum
tradita sunt tristi munere ad inferias,
accipe fraterno multum manantia fletu,
atque in perpetuum, frater, aue atque uale.*



Richard P. Feynman

1918-1988

By Jacqueline Bonner

NOBEL LAUREATE RICHARD PHILLIPS FEYNMAN died in Los Angeles on Monday, February 15, after a long illness. One of this century's most brilliant theoretical physicists and original thinkers, Feynman was the Richard Chace Tolman Professor of Theoretical Physics at Caltech, where he had been on the faculty since 1950.

Feynman was born in Far Rockaway, New York, in 1918. His father, a clothing salesman, determined that *young Richard would be a scientist*, and made a continuing effort to help him in that direction. He began by teaching him elementary mathematics when he was still in his high chair, used a toy wagon and a ball to explain inertia to him, and read aloud to him the science articles from the *Encyclopaedia Britannica*. He also helped him understand their implications—"translating" them, Feynman said. Another lesson was that names don't constitute knowledge. "I learned that when you know the name of a bird in every language, you know nothing, but absolutely nothing, about the bird," Feynman recalled.

After graduating from Far Rockaway High School, Feynman attended the Massachusetts Institute of Technology where he graduated with a BS in 1939. From there he went to Princeton to work with John Wheeler, and received his PhD in 1942. After war-time work at the Los Alamos Scientific Laboratory—where he divided his time between trying to solve the secrets of the atom and of cracking safes—Feynman became professor of theoretical physics at Cornell, where he worked with Hans Bethe. It was there in a period of about four years that he did the work that led to his sharing the Nobel Prize in Physics in 1965 with Shinichiro Tomonaga of Tokyo and Julian Schwinger of Harvard. They had worked independently on problems in the existing theory of quantum electrodynamics; Feynman basically rebuilt the theory from the beginning.

Quantum electrodynamics was born in the late 1920s when Dirac, Fermi, Heisenberg, and Pauli applied the new quantum mechanics to the old equations of Maxwell's classical electrodynamics. The new theory, by quantizing the fields and physical quantities involved, was able to describe the standard radiation processes occurring in atomic physics, but it was, nevertheless, not able to provide precise answers to some questions. Thus, when an electron moved into a lower energy orbit and emitted a photon, the theory could predict only a first approximation of the wavelength of the photon. Correction terms in the equations, which should have yielded more precise answers, diverged and gave infinite values, which were physically meaningless.

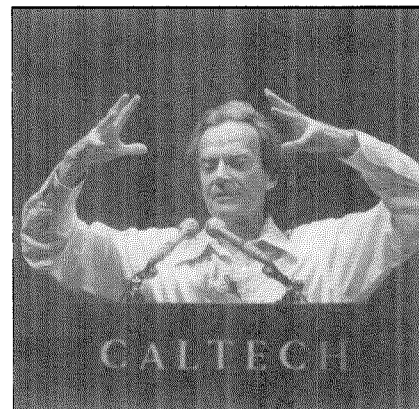
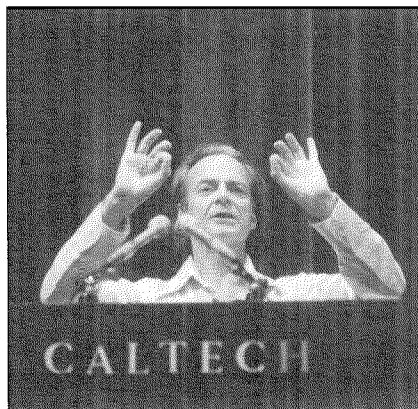
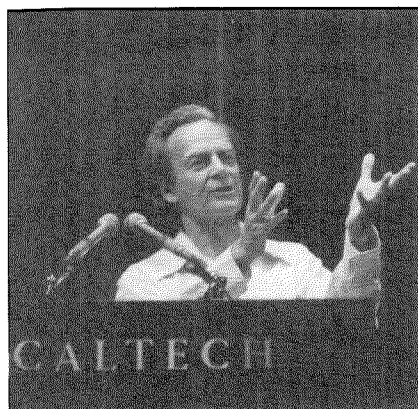
In 1946 experiments were already being conducted with much improved accuracy, made possible by the development of microwave techniques, and the weaknesses of the existing theory became glaringly evident. Feynman's radical approach to correcting the theory was to reconstruct almost the whole of quantum mechanics and electrodynamics from his own point of view. He treated all events in terms of particles, simplifying the interaction calculations largely through developing his famous diagrams of the interaction trajectories. By 1965, modern quantum electrodynamics had

brought order to that vast part of physics lying between gravity and nuclear forces, and his simplified rules of calculation had become standard tools of theoretical analysis in both quantum electrodynamics and high-energy physics.

Feynman was a visiting professor at Caltech in the early part of 1950, and later that year accepted a permanent faculty appointment. He became Richard Chace Tolman Pro-

fessor in 1959. Over the years at the Institute he worked with Nobel laureate Murray Gell-Mann on a theory for weak interactions; he formulated a mathematical theory that explained a whole range of properties of liquid helium at very low temperatures; and he did theoretical work on how the structure of the proton is revealed in bombardment by high-energy electrons.

He became something of a legend



for other reasons as well, known not only for his science but also for his extraordinary ability to communicate its meaning to audiences at all levels. Students appreciated his efforts in their behalf, voting him an award for teaching excellence in 1982. These awards are made on the basis of student evaluations of the instructors' clarity, enthusiasm, command of the subject, rapport with the class, and interest in the students as individuals. On the morning after his death they expressed their feelings more directly by hanging a huge banner that said, "We love you, Dick," from the top of the tallest building on campus.

A concrete expression of the respect and admiration the Caltech community felt for him occurred a few years ago when word reached the campus that Feynman needed massive transfusions after major surgery. Within hours Caltech students and faculty had donated over 100 pints of their own blood to the appropriate blood banks in his behalf.

Other manifestations of the Feynman/student rapport showed up when he appeared in full academic regalia for commencement whenever it was physically possible for him to do so, and one year he gave the commencement address. He attended Freshman Camp now and then, made appearances in several of the annual musicals (once in *South Pacific* dressed as a South Sea islander playing the bongo drums; another time in a production of *Guys and Dolls*, for example), and he regularly gave a lecture to the freshman physics class, never talking down to them and always challenging them to the limits of their abilities. He continued to meet his classes until just two weeks before he entered UCLA Medical Center for the last battle in his eight-year struggle with a rare form of abdominal cancer.

Appreciation was also manifested by the faculty. Whenever it became known that he was going to lecture on any topic, the largest lecture hall available was made ready for what was sure to be an overflow crowd. Seating on such occasions was so valuable, in fact, that the room filled up long before Feynman appeared on the platform. "I always come to Feynman's lectures," said an old-time faculty member, "because I'm sure there will be at least one good surprise."

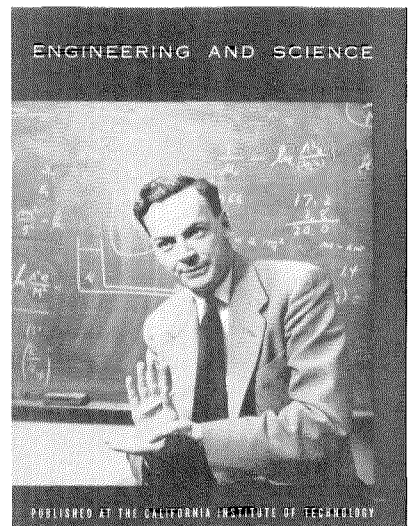
Sometimes that surprise was a new idea, and sometimes it was also extraordinarily good theater. In 1973 British audiences saw a Yorkshire Television interview with Feynman called "Take the World from Another Point of View." The title was a capsule statement of Feynman's outlook, and television viewers all over the world got to see an example when, as a member of the President's Commission on the Space Shuttle Challenger Accident, he performed his "little experiment." While an expert from NASA was testifying, Feynman demonstrated what happened to a synthetic rubber O-ring dipped in a glass of ice water. It was no surprise at all when he issued his own explanatory addendum to the commission report. One faculty member with long experience on boards of inquiry asked the pertinent question when his appointment was announced. "Do they realize," he wondered, "that Feynman asks questions—and that he keeps asking them until he gets answers?"

The biggest surprise of all—to those who knew him—was that he accepted the appointment. He liked to describe himself as "actively irresponsible," and had a highly developed distaste for the bureaucratic mind-set and the pointless activities of most committees. He needed lots of solid time to think, and he made sure he had it. Time-wasters got short shrift from him. He also hated formality, and considered declining the Nobel Prize because of his aversion to pomp and circumstance.

In addition to the Nobel Prize, Feynman had been awarded the Albert Einstein Award from Princeton and the Einstein Award of Albert Einstein College of Medicine, the E.O. Lawrence Award of the Atomic Energy Commission, the Oersted Medal for Teaching, and the Niels Bohr International Gold Medal. He was also a foreign member of the Royal Society.

Much as science interested him, it was not his whole life, and his well-known playing of bongo drums was not his only outside interest. It was, for example, a point of pride with him to deliver his lectures in the language of the country in which he was speaking, and fortunately he had a facility for learning new ones. He thus spoke several, including both Spanish, which

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An Editor

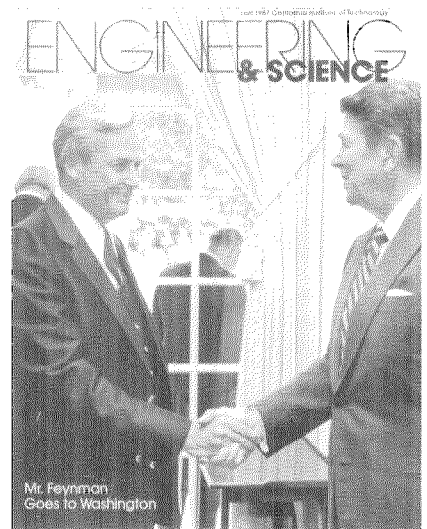
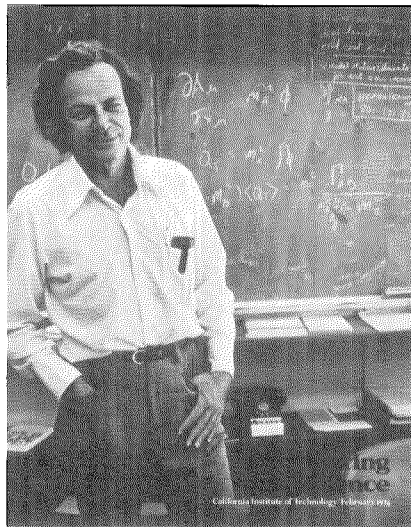
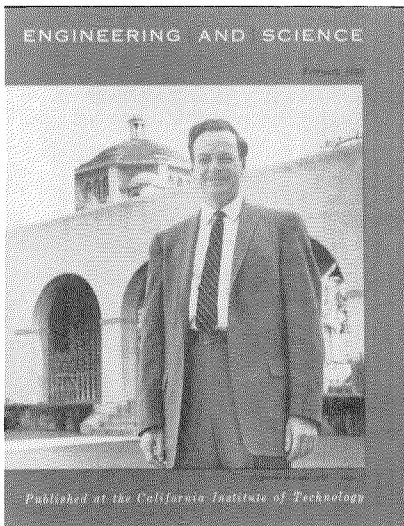
IN A CERTAIN SENSE, we all knew different Richard Feynmans. His colleagues knew the brilliant theoretical physicist; his students knew the electrifying teacher; Caltech's drama coach, Shirley Marneus, knew the earnest actor; his art teacher, Tom Van Sant, knew the apprentice artist.

The Feynman I knew was the writer. Not that he ever wrote. Well—*hardly* ever. But he *talked*. How he talked. To his colleagues. To his students. To his friends. To whoever sat near him in the campus cafeteria. In a pinch—to himself.

But *write*, he did not.

When Feynman first came to Caltech in 1950, I was editor of *Engineering & Science*. Our articles were written for the most part by faculty members or distinguished visitors to the campus. Sometimes we would get a man to revise a technical paper he had presented at a scientific meeting—scaling the paper down to more general understanding. And sometimes we would work over a talk written out to be read at a departmental seminar. Or, after reading an official report on a research project, we would ask a faculty member to write up a more general account of his work. And sometimes, miraculously, he would say yes.

With Feynman we had to resort to



Remembers Feynman, the “Writer” *By Edward Hutchings Jr.*

the tape recorder. The tape recorder was just a pup in the early fifties. Before tape, there was a monstrous machine known as the wire recorder, which had a mean habit of doggedly unreeling mile after mile of snarled wire onto your office desk when you started it up.

Even in his first days at Caltech, there were constant demands on Feynman’s time. Later, and particularly after he won the Nobel Prize, he became very skillful at protecting himself. But in those early days he was saying yes to everything—including giving talks to everyone from the American Physical Society to an undergraduate student assembly.

As soon as *E&S* discovered that Feynman had agreed to give a public talk, we would call him up. If he answered his phone at all (and he was already beginning to go to a lot of trouble to keep from doing this), he was quite likely to start the conversation, not with “hello,” but with, “*now what?*”

Undaunted, we would foolishly ask if he intended to write out his talk. “*Write?*” he would say scornfully. “I won’t even know what I’m going to say until I say it.”

Then how about making a tape of the talk?

A tape? If we wanted. It would

make no difference to him.

So we would tape the talk. And transcribe it. And send him a copy of the transcript. His reaction was the same (well, as with everything about Feynman, it was perhaps a little heightened) as that of most people faced with a direct transcript of what they have said in public. He was appalled.

The fact is that verbal communication—including extemporaneous talks or lectures—has very little in common with written communication. When most of us speak, grammar goes out the window, sentence structure is violated, sentences are rarely completed, and repetition is rampant. By writing standards it’s a mess.

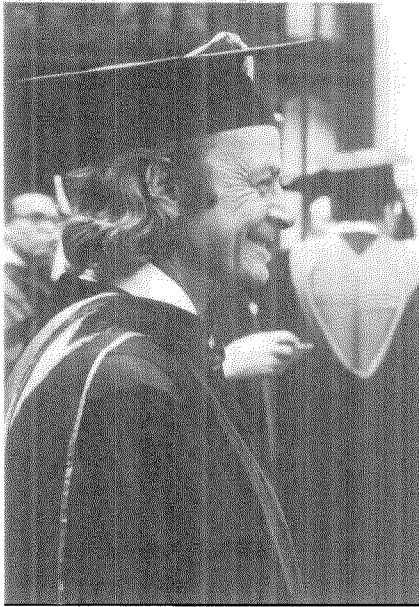
So, to regain his self-respect, Feynman would gladly work with us to turn his chaotic transcript into a publishable article. And I must say that he always took as much satisfaction in the end result as we did. *E&S* and Richard Feynman soon became a mutual admiration society, and Feynman got to calling me “my publisha.”

We did manage to publish almost a dozen of his talks over the years—talks that covered some of his more general interests, aside from physics. All of them were enormously popular—partly I think because we went to a great deal of trouble to not make too

many changes, so that they still, in writing, sounded like Feynman speaking. And, as we all know so well at Caltech, Feynman speaking was pure gold—especially in a Far Rockaway accent that could lure you even into thinking that you were finally beginning to understand physics for the first time.

One of my encounters with Dick Feynman in the early fifties occurred in the newly opened Alumni Pool. A dedicated swimmer, I was huffing and puffing after doing my daily quota of laps in the pool, when Feynman lowered himself gingerly into the water beside me and stood there glowering at the prospect before him. Finally he set off, swam briskly to the far end of the pool, then turned around and swam back to where I was still standing. He rose up out of the water with a look of surprise on his face. “*This,*” he said, succinctly, “*is boring.*” And he got promptly out of the pool—never, to my knowledge, to return.

So I learned early: If it was boring, Feynman wouldn’t do it. We may all have known different Feynmans, but we all knew the one to whom life was an adventure. To be in his company was to share some of that sense of adventure, to catch some of his excitement, to feel some of his enthusiasm. It was a very great privilege. □



he learned in preparation for a visiting professorship in Brazil—and Portuguese, which he quickly acquired when he discovered that it (not Spanish) was the language of Brazil. He enjoyed drawing and painting and worked with professional artists to develop his technique. Archaeology was another subject of investigation for him, particularly the challenge of trying to decipher Mayan hieroglyphics.

Of his publications, the most recent was *QED: The Strange Theory of Light and Matter*, which was published in 1986. In it Feynman undertook to explain quantum electrodynamics to the general reader—without using a single equation. His 1985 *Surely You're Joking, Mr. Feynman*, which spent 14 weeks on the *New York Times* best-seller list, was

the result of taped conversations with his friend Ralph Leighton. His earlier textbook, *The Feynman Lectures on Physics*, co-authored with Robert B. Leighton and Matthew Sands and published in 1963, has become one of the world's most popular physics books, and a best-seller in its own right. A footnote in Volume 1 of the three-volume set displays the poet and mystic in Richard Feynman and his profound awe at the wonders of the universe:

“The stars are made of the same atoms as the earth.” I usually pick one small topic like this to give a lecture on. Poets say science takes away from the beauty of the stars—mere gobs of gas atoms. Nothing is “mere.” I too can see the stars on a desert night, and feel them. But do I see less or more? The vastness of the heavens stretches my imagination—stuck on this carousel my little eye can catch one-million-year-old light. A vast pattern—of which I am a part—perhaps my stuff was belched from some forgotten star, as one is belching there. Or see them with the greater eye of Palomar, rushing all apart from some common starting point when they were perhaps all together. What is the pattern, or the meaning, or the *why*? It does not do harm to the mystery to know a little about it. For far more marvelous is the truth than any artists of the past imagined! Why do the poets of the present not speak of it? What men are poets who can speak of Jupiter if he were like a man, but if he is an immense spinning sphere of methane and ammonia must be silent? □

