

# R. R. MARTEL

## Professor of Structural Engineering

**R.** R. MARTEL, Caltech professor of structural engineering, has had a long and successful career, both as a teacher of civil engineering and as a consultant in the fields of bridge design and the design of flood control structures and reservoirs. He is nationally known as an authority on the design of structures to resist earthquakes.

When a man has such a distinguished record and reputation, it is usually interesting to know something about how he got his start, and what it was that led him into a career that has proved to be so impressive.

Martel has a simple explanation. He was a high school senior, and not at all sure what field he wanted to get into, when he happened to see a surveyor at work one day. It was the first surveyor he had ever seen, and this carefree character was wearing a slouch hat, gloves and boots; he was working out in the open air; and he was operating a fascinating-looking instrument. All in all he looked like a man living a good life. Then and there Martel decided that it was the life for him. He went into civil engineering.

If this story seems regrettably short on inspirational values for the oncoming generation of civil engineers, let them merely consider the fact that Martel has never regretted this seemingly chance choice for a single instant; he's *still* living that good life.

R.R. (for Romeo Raoul) Martel was born in Iberville, Quebec, in 1890. His father, a farmer, soon moved the family to the United States, however, and when Romeo was six months old they settled in Pawtucket, Rhode Island, where the elder Martel went into the real estate and insurance business.

In 1908 Romeo entered Brown University (where his freshman English instructor, a young man teaching his first class, was George R. MacMinn, now professor emeritus of English at Caltech). After graduation Martel taught civil engineering for a year at Rhode Island State College, then at Mechanics Institute in Rochester, New York, for another year. In 1915 he went to work

as assistant engineer for the Sayles Finishing Plants, a string of cotton mills scattered through Rhode Island. In 1918, several months after he had taken a job with the Atchison, Topeka and Santa Fe Railroad in Amarillo, Texas, he was offered a teaching position at Caltech. This offer was, to put it mildly, something of a surprise.

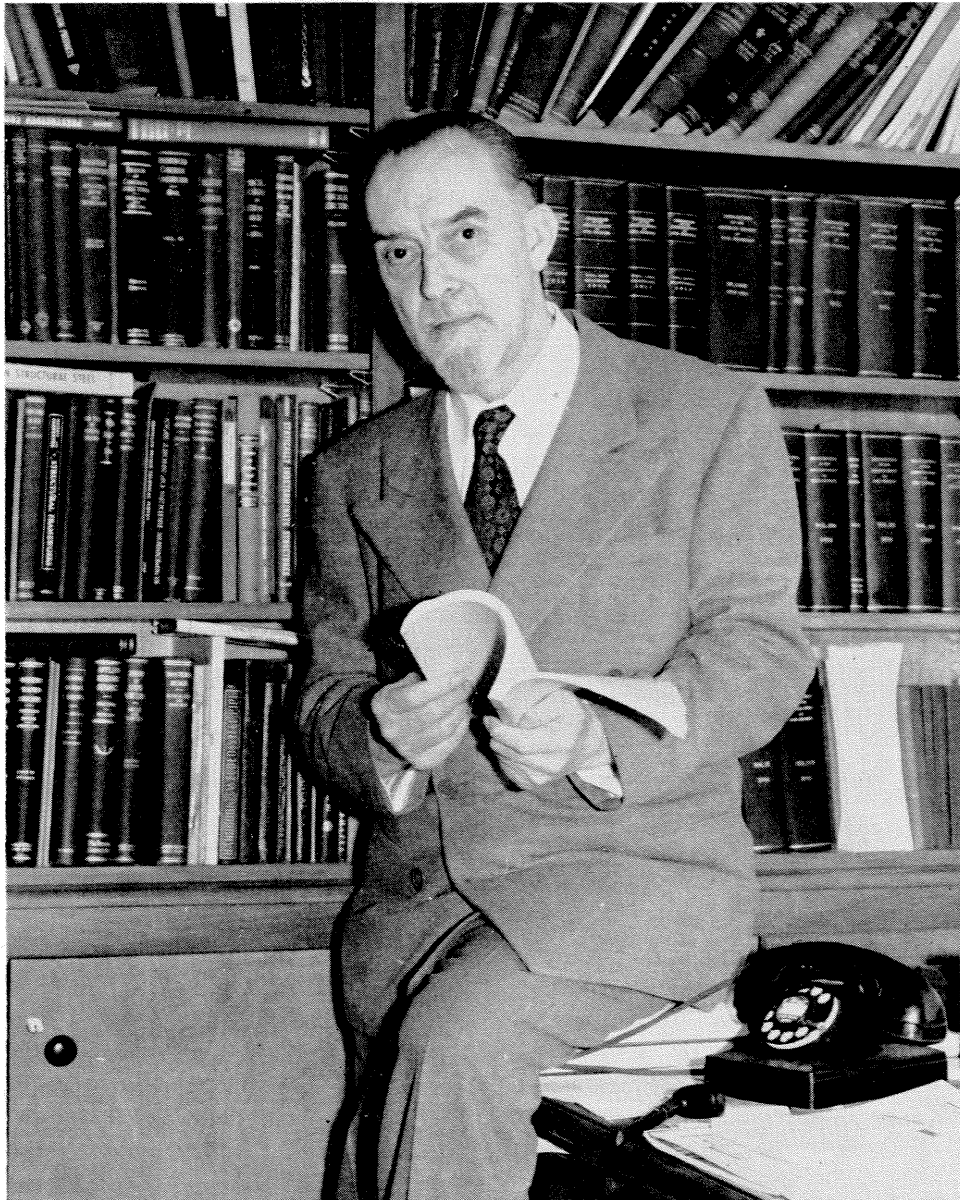
While working in Amarillo, Martel had, at intervals, applied for jobs at a number of schools in which he thought he would like to teach. Most of these applications had brought no response at all, but here, after some months, was a reply from Caltech—and a brisk, no-nonsense reply at that. In substance, it said, “How long will it take you to get here?”

It was some time later that Martel pieced together the story of his hiring. His application had gone to Franklin Thomas, who was the Institute's civil engineering department at that time. In his lifetime, Thomas was notorious for never throwing anything away, so he slipped the Martel application into a pile on his desk. As World War I was ending, it became apparent that the Institute was going to be flooded with new students, and Thomas plowed into his stack of applications to find a fast addition to the civil engineering staff. It is Martel's contention, to this day, that he got the job because he was the closest man to Pasadena in the stack.

Nevertheless, he welcomed the job, and, shortly afterwards, was married to Mildred Pray, a high-school classmate from Rhode Island.

In 1918 the Institute was confined to Throop Hall, and the civil engineering department occupied the space now taken up by the Alumni Office. There was a strict no-smoking edict in those days, so the faculty often found it necessary to take surreptitious cigarette breaks out in the orange grove in back of Throop Hall—finishing off with a healthful fresh orange as they hurried back to class. Most of the faculty brought their lunch every day and ate together under the trees in Tournament Park.

In 1921 Franklin Thomas, a Pasadena City director at the time, recommended Martel as a consultant on the



*R. R. Martel, authority on the design of structures to resist earthquakes.*

construction of the city's San Rafael bridge. It was the beginning of a distinguished career for Martel. He has been a consultant on bridges for the cities of Pasadena and Glendale, the State of California, the Southern Fuel Company and the Southern Counties Gas Company.

He has consulted on the design of flood control structures and reservoirs for the U. S. Army Engineers in Los Angeles, and for the cities of Glendale, Burbank and Riverside.

And he has been a consultant on the seismic provisions of such buildings as the Southern California Edison offices in Los Angeles, the First Trust Building in Pasadena, the Fruit Growers Exchange in Los Angeles, the Glendale Power House, the Bridge Auditorium

in Pomona and most of the buildings on the Caltech campus.

Martel was one of the first engineers to become interested in the field of earthquake-resistant structures—and very possibly the first of all to go into this field with a serious and continuing interest. Characteristically, he gives the credit to Robert A. Millikan for pushing him into it.

After the destructive Santa Barbara earthquake of 1925, which was California's first big quake since the San Francisco one of 1906, R. A. Millikan—then chairman of Caltech's Executive Council—formed a group of engineers, seismologists, architects and businessmen to work on the problems of earthquake-resistant con-

struction. Martel was the Caltech representative on the committee.

The work of this organization received little attention from the public at large until the Long Beach earthquake of 1933 reminded southern Californians that earthquake-resistant construction could be a personal matter. Building codes were adopted in nearly all southern California cities—and not only adopted but enforced. New buildings were *required* to meet specific standards to make them better able to withstand any future quakes. The 1941 earthquake in El Centro showed how well these new buildings stood up; again, in Tehachapi in 1952, buildings which had been constructed under the new codes came through remarkably well.

Martel has been serving on building code committees since the late twenties—for the city of Pasadena, the American Standards Association, the Structural Engineers Association, the State Division of Architecture and the State Chamber of Commerce among others. In this work he has been responsible for a number of refinements for taller buildings in southern California, and he has helped to bring about a better approximation to the pattern of forces that act on a building in an earthquake. At Caltech today Martel and his colleagues continue to study these forces by analyzing the response of structures to recorded earthquake ground motion, using a special analog computer constructed in the engineering laboratories.

### Earthquake-resistant construction

Since 1947 Martel has served on the Advisory Committee of Engineering Seismology. Originally set up by the U. S. Coast and Geodetic Survey to advise it on such problems as how to make seismic measurements and what instruments to use, the committee gathered such a mass of data on engineering seismology that its services were eventually extended far beyond an advisory capacity. In 1952 the 13 members of the committee (which include Dr. George Housner, Caltech professor of civil engineering and applied mechanics, as well as Martel) set up the independent, non-profit Earthquake Engineering Research Institute. This organization bridges the gap between the science of seismology and actual building design and construction, collecting, compiling, correlating and distributing seismic data, and promoting research with the specific objective of developing safe and economically feasible methods of earthquake construction and design.

In 1926 Martel was the delegate of the Southern California Council on Earthquake Protection to the 3rd Pan-Pacific Science Congress in Tokyo, and again, in 1929, to the World Engineering Congress there.

As usual, Martel made his mark here too. Last summer, George Housner and Donald Hudson, Caltech professor of mechanical engineering, on a tour of Japan, were entertained at dinner by the Japanese engineering society. The speeches after dinner were in Japanese, so Hudson and Housner were unable to pick up much

useful information from them. In fact, they were able to understand only three words all evening—"Martel-san," which was repeated over and over again, and finally the surprising phrase, "Indian suit."

Tracking down an interpreter later on, they discovered that the speakers had first of all discussed the memorable visits to Tokyo of the famous Professor Martel. Then, Dr. Tachu Naito, the well-known structural engineer and architect, had described one of Martel's memorable contributions to Japanese culture: Prior to his 1929 visit, it seems, Martel had written to see what kind of present he could bring from the United States to Dr. Naito's small son and that was the way in which young Naito happened to become the first Japanese to own an American Indian outfit, complete with feathered headdress.

When Martel came to Caltech as a civil engineering instructor in 1918, he didn't confine his teaching to civil engineering subjects by any means; in fact, he taught algebra, trigonometry and just about anything else that came along. Over the years, however, he worked into different aspects of structures (steel, wood and reinforced concrete) and this then became his teaching field.

He is no longer the only teacher in the family; his son Hardy is now an assistant professor of electrical engineering at Caltech. Hardy Cross Martel (named after an engineering instructor Martel studied under at Brown University — now the distinguished Professor Hardy Cross of Yale University) now has a son of his own. Hardy was graduated from Caltech (a rare feat for a faculty member's son) in 1949, received his MS from MIT in 1950 and is now completing the requirements for his PhD at Caltech. His sister Nancy works on the San Francisco *Chronicle*.

### The man who came to dinner

Working in a field which is of such concern to southern Californians, Romeo Martel has, of course, been called upon often to speak at dinners and banquets. One of these occasions, however, stands out in his memory above all the others.

Martel had agreed to speak at a large, formal affair at a Los Angeles banquet hall. His speech prepared, he arrived at the dinner in good time.

"Professor Martel," he said, introducing himself.

"Ah!" said his hosts, greeting him warmly, "Professor Martel!" And they seated him at the speakers' table.

As he sat listening to the other speakers after dinner, Martel found their talks increasingly obtuse. Slowly he came to the realization that he was at the wrong banquet.

There was a moment of panic; then reason set in again and he relaxed and enjoyed what was left of the evening. At the end of the affair, puffing on a fine banquet cigar, he thanked his hosts for a delightful evening and disappeared into the night—one speech ahead of the game.