

Random Walk

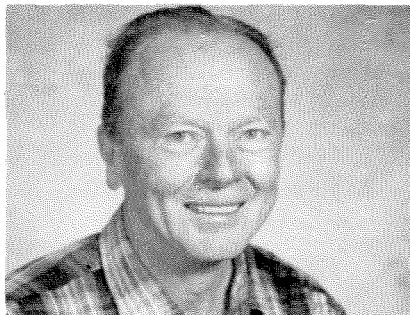
New Provost



ROCHUS E. VOGT will become vice president and provost of the Institute on April 1, replacing Institute Professor of Chemistry John Roberts. Vogt, the first R. Stanton Avery Distinguished Service Professor, is also currently chairman of the Division of Physics, Mathematics and Astronomy. He came to Caltech in 1962 after receiving his SM and PhD degrees from the University of Chicago.

Vogt is an authority in research on cosmic rays and co-founder with physicist Edward Stone of the Caltech Space Radiation Laboratory, whose new instruments and experiments have led to significant advances in understanding of these rays. He is currently principal investigator on the Voyager 1 and 2 cosmic ray experiments. He is the author of numerous scientific papers in the field of high-energy astrophysics, a fellow of the American Physical Society, and a recipient of a NASA Exceptional Scientific Achievement Award.

Driver Education



PROBABLY drivers of automobiles thrusting down the highways and byways of the world seldom wonder why

they are going down the right — or the left — side of the road. But alumnus Richard Hopper (PhD '39) has used his all-over-the-world travels as an oil geologist for some 40 years, first, to observe the varying customs, then to do some research into their origins, and, finally, to write an article about what he found out. "Left-Right: Why Driving Rules Differ" was recently published in *Oil Progress*, a publication of Caltex Petroleum Corporation that is not distributed in the United States; an adaptation of the article appeared in the October 1982 *Transportation Quarterly*. Hopper deduced that the reasons some countries drive on the right and others on the left derive from the following facts:

- About 90 percent of the human race is, and always has been, right-handed.
- In the Middle Ages this right-handedness motivated travelers, on foot or horse, to keep to the left for defensive purposes in passing oncoming traffic, so as to be able to use swords or lances in right hands. In recognition of this custom Pope Boniface VIII in 1300 A.D. declared that "all roads lead to Rome," and directed pilgrims to keep to the left side of the road. This edict had something of the force of law in much of western Europe for 500 years.
- Beginning about 1750, however, in America and France large freight wagons were built Conestoga-style, with no drivers' seats but with the driver astride the left rear horse of the six- or eight-horse team, using his long whip in his right hand. This impelled drivers to edge to the right in passing oncoming wagons, so as to be able to see down to their left and avoid banging axle hubs or wheels when passing closely on narrow roads. The first law in this country making right-hand travel compulsory was a Pennsylvania state law of 1792.
- In Britain, by contrast, freight wagons were smaller and built with drivers' seats at the front. On these seats the drivers naturally sat as far to the right as possible, so as to use their long whips in their right hands without interference from the loads behind them. This motivated drivers to edge to the left in passing oncoming vehicles, again so as to be able to see down and pass closely without hitting. Britain's first law requiring keep-left traffic was passed in 1756.
- Today, three of the world's five most populous countries — the USA, the USSR, and China — use the right side.

The other two — India and Indonesia — use the left. Most countries now or once under British rule still keep to the left; exceptions are the USA, Canada, Nigeria, Burma, Belize, and Gibraltar.

• The Swedish were the last of the mainland Europeans to drive on the left, and they switched to the right in 1967. A more recent change took place in Okinawa, where residents drove on the right during the American occupation after World War II. But in 1978, after again becoming part of left-driving Japan, the island switched back to the left. The total cost of the change, made over an eight-hour-long, no-traffic-allowed period, is estimated at \$80 million.

Hopper retired in 1979 from his position as vice president of American Overseas Petroleum Limited in New York City; he now lives in Connecticut.

Richter Seismo Lab



Back in 1932, Charles Richter (now professor of seismology emeritus at Caltech, devised a quantitative way of describing the magnitude of an earthquake — the well-known Richter Scale.

In honor of this achievement and many others, the Charles F. Richter Seismological Laboratory was recently dedicated at UC Santa Cruz, and Richter himself was happily there in person.

In Memoriam

BRUCE SAGE, professor of chemical engineering, emeritus, since 1974, died on January 11 at the age of 73. Sage, who held two Caltech degrees (MS '31, PhD '34), became a research fellow at the Institute in 1934. Just ten years later he was a full professor. His contributions to the study of the physical properties of hydrocarbons resulted in major advances for petroleum technology. Among his awards were the national Medal for Merit for work on the manufacture of propellants during World War II and the Naval Ordnance Test Station's Thompson Award for management of the rocket ordnance program. He is survived by his wife, Helen, of Winston, N.M., and South Laguna.