

A RANGING MIND

The varied interests of Walter Orr Roberts, president of AAAS, carry him from the sun's corona and physics of the atmosphere to science policy and music every Sunday.

by Barbara J. Culliton

Navy

"I've probably taken more pictures of the sun than anyone ever has." Roberts discovered spicules rising on the sun.

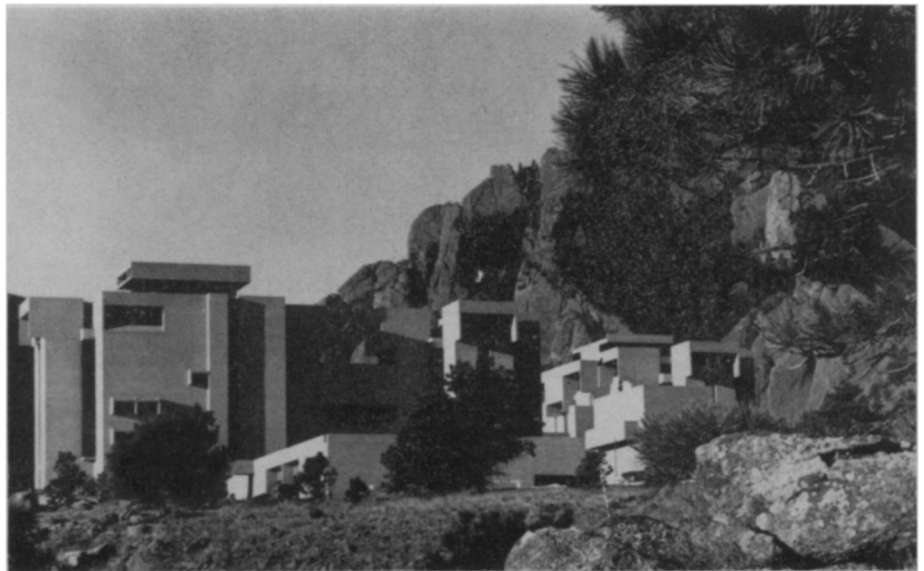
On a clear day a few years ago, Walter Orr Roberts whizzed down a Colorado mountain, relishing the speed, the feel of the wind and the challenge of the slope. When he reached the bottom, he took off his skis for the last time.

Reminiscing, 53-year-old Dr. Roberts, who was an expert skier and a one-time member of the rescue patrol, says he decided to retire from the slopes before age forced him to slow down. In other pursuits, he shows no signs of letting go.

Walter Roberts is a shrewd judge of situations and a persistent diplomat whose talents as astronomer and administrator built in Boulder, Colo., one of the country's most prominent centers for the study of the atmosphere.

He is director of the eight-year-old National Center for Atmospheric Research, an institution supported 90 percent by the National Science Foundation, where some 500 scientists representing a variety of disciplines work with a view to dealing more effectively with problems of air pollution, climate modification and long-term weather predictions.

When, in 1960, the trustees of the new research center asked Dr. Roberts if he were interested in the director's job, he said he was, but that it would be a waste of time to talk about it because his preconditions would be unacceptable. He would insist, he said,



NCAR

NCAR's modern-day Druid temple—a laboratory you can get lost in.

that the NCAR be built in Boulder and that the High Altitude Observatory at Climax, 11,500 feet above the sea, be somehow incorporated into the new organization they wanted him to head.

The trustees liked both conditions and Roberts went to work. After convincing the State of Colorado to donate a site on the mesa at the foot of the Rocky Mountains, NCAR commissioned New York architect Ieoh Ming Pei to design a laboratory that would harmonize with the landscape and, at

Dr. Roberts' request, be a building that one could get lost in. He got his wish. Pei's edifice, set against the Flatiron Mountains, has overtones of a Druid temple approached by winding walkways that detour around pine trees.

Walter Roberts' dislike of sterile offices and his love of open spaces reflect his creative approach to science and, his colleagues say, his generous spirit. He believes in the "constantly expanding pie" theory of human relations, one friend comments, with real enthusiasm

for his associates' research and the conviction that there's enough prestige to go around.

In January Dr. Roberts assumed the presidency of the American Association for the Advancement of Science, an honor he delights in for the opportunities it will give him talk with other scientists as the AAAS spokesman at U.S. and foreign meetings.

No longer directly involved in the laboratory side of science, Dr. Roberts spends his energies on issues of policy and is concerned with the impact of science on mankind. He is impressed with the rapid advances in science and technology during the past quarter of a century but is fond of pointing out that things have not really moved as quickly as it seems.

"Sputnik I made us realize that we were living in the age of man's conquest of space," he says. But he suggests that its origins go back even to 1650 "to Cyrano de Bergerac's wild concept of a flying machine powered by the lift of the morning dew."

Dr. Roberts cringes at the "do not spindle, fold or mutilate" command of computer cards and deplores the degree to which scientific advances threaten the human condition they could do so much to improve.

"To a tragic degree we in the West have drifted, not so much for lack of willingness to pay the price, but for lack of knowing what it is that we have really wanted—aside from factories and a rise in the standard of living."

But basically, he is an optimist, with long-standing interest in the AAAS's effort to create public understanding of science. He believes that solutions can be found and the humanity of man preserved if more persons are brought into the policy side of science.

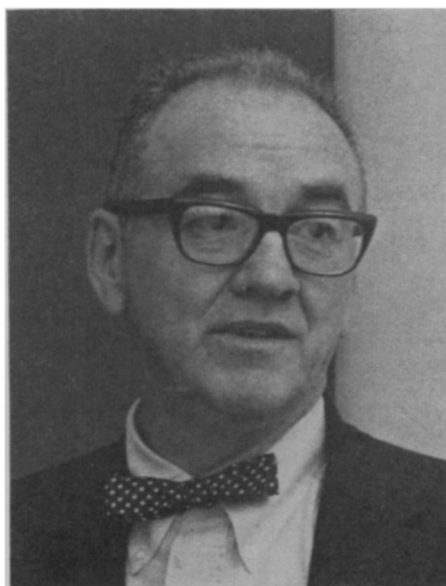
"If I have my way," Dr. Roberts says, "I'll retire at 55, give up daily administrative duties at NCAR and spend my time as a consultant for various projects and boards." In addition to his duties as president of AAAS, Dr. Roberts is a member of the Geophysics Research Board of the National Academy of Sciences, of the Bureau of Reclamation's Advisory Committee on Atmospheric Water Resources, of the U.S. National Commission for UNESCO and a trustee of Amherst College from which he graduated in 1938.

From Amherst he went to Harvard for his M.A. and Ph.D. in astronomy, working under Drs. Harlow Shapley and Donald Menzel. "There was one period," Dr. Roberts recalls, "when I thought one couldn't make a living in astronomy, so I switched to physical chemistry. But I wasn't very good at it, and just at that point I lost my girl and decided that as a life-long bachelor I

wouldn't need much money anyway, so I went back to astronomy."

A few months later, Walter Roberts' mother introduced him to Janet Smock whom he married a year later, in 1940. They bought a \$100 Graham-Paige, loaded it with the coronagraph—a camera for photographing the sun—and headed west to the small mining town of Climax, Colo.; once there Dr. Roberts put the coronagraph together almost single-handedly and settled down for seven years of picture-taking at what became the High Altitude Observatory.

"Walter and Janet spent months at a time snowed in in Colorado, and apparently they loved it," S. Douglass Cater says of the Roberts. Cater, now a Special Assistant to the President, met Walter Roberts when he was doing



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"We have to know what we want."

graduate work at Harvard. "I used to give lectures to earn money," Cater recounts, "and one snowy day I spoke to the senior Mrs. Roberts' women's club. The weather was so bad I had to spend the night and Walter and I became good friends even though we have practically nothing in common." The Roberts lived in the country in Massachusetts where Walter Roberts was born in 1915.

At Climax the Roberts lived in a house astride the continental divide. By dumping their dishwasher out the front door in one direction or another, they could decide whether it would eventually end up in the Atlantic or the Pacific.

The sun's corona that Dr. Roberts spent so many years photographing is a faint halo surrounding the star. The coronagraph blocks out the main body of the sun, creating in effect an artificial eclipse. "I've probably taken more pictures of the sun than anyone ever has,"

he says. In his own estimation, his most valuable contribution to science was made in 1943, when he recognized the sun's spicules—small but regularly present jets of gas. What they do has yet to be proved but Dr. Roberts theorizes that they are probably a mechanism for transferring heat from the sun's surface to the corona. The surface is only 6,000 degrees C, compared to the heat of the corona which reaches millions of degrees C.

During World War II Dr. Roberts' knowledge of the sun was put to work for the military in classified projects for long-distance radio communications. To transmit messages across continents and oceans, scientists bounce radio waves off the ionized layers of the earth's outer atmosphere, some 400 to 600 miles away. Ionospheric conditions, sometimes receptive to radio waves and sometimes impervious, are affected by solar activity. Events in the corona that Dr. Roberts knows so much about give clues to what's going on in the sun—information that can be used to predict the state of the ionosphere and chart paths for message sending.

Later, Dr. Roberts' interest shifted to the nearer atmosphere and the effects of the sun on weather, an area in which he was working before his move to science administration. "I think my objective in life was really to be a business manager," he says, looking back.

His administrative interests, an outgrowth of both a talent for leading and a desire to influence the course of science policy, also led Walter Roberts to his sense of the importance of explaining science to the public. He worked for a time on science scripts for The Twentieth Century television program, after previously doing radio and newspaper work.

The Roberts have four children—David, 24, Alan, 23, Jennifer, 21, and Jonathan, 15, who is the only one still at home with his parents in Boulder where they live in what friends describe as a "modest, one-story frame house." By a tradition of some 20 years, their home is the site of "listening" every Sunday evening at 7:30. Then, all work is put aside for a concert of carefully pre-selected classical music. The Roberts and friends gather for coffee and music from the family's extensive record collection. "It's a time of complete relaxation," Dr. Roberts says. "We just listen—no one has to say a thing." Sunday evening music takes top priority in Walter Roberts' scheme of things. "I'll fly all night from the other side of the world to get home by 7:30 Sundays," he says. His departure from the AAAS meeting in New York last December was strategically timed to get him to Boulder by 7:30.