

*Robert Grover is a living legend in cardiovascular pulmonary research. He and his first wife Estelle conducted research in the highest places on three continents. In his Denver lab, he trained many of today's leading researchers. Read about the scientist outside the laboratory, from Colorado cabin to Mount Everest.*

## **Always a Quest**

by Norma Elise Waalen

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# Always a Quest

**The Life and Times  
of an American Medical Pioneer  
Robert F. Grover, M.D., Ph.D.**



**Bob Grover in his basement home lab in  
Rochester, New York, when he was 14 years old.**

**Norma Elise Wäälén**

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TITLE PAGE PHOTOGRAPH BY ESTELLE GROVER: Robert F. Grover ascending the snowy slopes of an active Mexican volcano, *Popocatepetl*, in December 1956. The summit is 17,900 feet (5,456 m.), and inside the crater, steep walls plunge 2,000-2,800 feet (610-853 m.). During Conquistador days, Spaniards roped down into the caldera to get sulfur to make gunpowder

“All royalties from sales of this book, *Always a Quest*, are donated by me to the American Thoracic Society (ATS), Restricted Funds, for the benefit of junior medical research scientists both national and international. Medical scientific research should know no geographic or political boundaries.”

Norma Elise Wäälén  
Arroyo Grande, California  
2017

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## Chapter 34

# The Cowboys

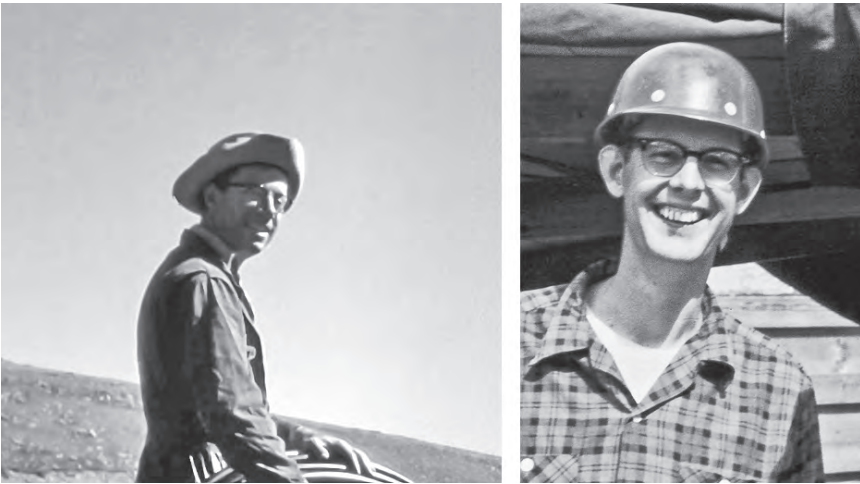


Figure 34.1: *Cowboys Bob and Jack.*

In July 1958, when Jack Reeves became a Research Fellow in Blount's Cardiology Training Program and was assigned to the Cardiology Diagnostic Catheterization Laboratory, he was to train under Bob's direction. Soon the pair learned that the veterinarians up at Colorado State University were studying pulmonary hypertension among cattle on ranches in the high-mountain parks at around 10,000 feet (3,048 m.). This was industrial-strength pulmonary hypertension progressing to outright heart failure, a condition known as *brisket disease*. Obviously this was relevant to the clinical interests of the diagnostic laboratory.

After meeting and working with the veterinarians for several months, Bob suggested that he and Jack conduct their own investigation of this phenomenon

in steers at even higher altitude. But how could it be funded? Independent research is funded out of the pockets of the researcher. Money is available from the National Institutes of Health (N.I.H.), which receives its money from the United States Congress. This money is granted to the university for allocation to the researcher when his proposal is accepted. At the conclusion of the study, any remaining funds (rare) must be returned to the university for re-budgeting.

Bob had learned that Blount had been awarded a modest individual grant from N.I.H. to study pulmonary hypertension. Bob recalls that it was about \$10,000. Although Blount was an excellent clinical cardiologist, he would often say to Bob, "One of these days I'm going to get back in the lab." But his heart wasn't in it. So his research grant was producing no results. Bob and Jack described to Blount their desire to conduct the study of pulmonary hypertension in cattle (appropriate to the basis for N.I.H. awarding the grant to Blount) and asked if they might use some of that grant money. Blount agreed but with one condition: the research could not interfere with the clinical catheterization schedule. They should have seen the red flag.

When it comes to the care and feeding of livestock, who would know better than the cattlemen who operate the Denver Union Stockyards? Bob and Jack presented their research plan to the cattlemen who were not only interested in the science of the project but also very accommodating to the scientists' needs. Ten Hereford steers and 12 spring lambs had to be purchased from ranches at low altitude in Kansas. The cattlemen helped Bob and Jack with the transaction in April. That, in itself, took a chunk of the research funds.

The cattlemen offered Bob and Jack space to work at the stockyards. Next, they helped with design of the portable corral they would have to erect high on Mount Evans for the conduct of the high altitude phase of the study. So-called "panels," each 6 feet high and 16 feet long (1.8 and 4.9 m.), were to be assembled using 2x6 inch (5.1x15.2 cm.) boards set into channel iron at each end; the lumber and hardware had to be purchased. The completed panels would then be joined end to end to form one large circle to confine the cattle and a second smaller one for the lambs—plus a storage area between the 2 for 8 tons (7,257.5 kg.) of hay together with many sacks of food pellets. More vital expenses.

Timing was critical. Data collection would be in two phases: the baseline studies at low altitude in Denver, followed by the high-altitude studies well

above timberline at 12,700 feet (3,870.9 m.) on Mount Evans, 60 miles (96.6 km.) west of Denver. At that altitude, you have about 2 months free of snow, July and August. Consequently, baseline data collection on each of the 22 animals had to be completed before the end of June. Concurrently, construction of the corral, transporting it to the mountainside, reassembling it, and establishing a continuous water supply in preparation for the arrival of the livestock also had to be completed before July.

Work on the project began in late April, and for the next 4 months, Bob and Jack wore two hats, figuratively and literally. Jack had a red hard hat while Bob wore a sombrero. All construction was done by the two of them on their own time. They would meet at the stockyards at 6:00 A.M., pull on their coveralls, power up the rotary saws and drills, and build panels until 7:30 A.M. Then they would rush off to the hospital, trade their coveralls for scrubs, and by 8:00 A.M. they had become doctors performing heart catheterizations on people.

The steers and lambs were also imported to the stockyards in late April where they were studied out among the holding pens. A complete heart catheterization was performed on each animal and for these procedures the assistance of their technicians from the cath lab was needed, but not on company time. This is where the team spirit of the C.V.P. Laboratory really came into play.

In addition to standard measurements, there was a special analytical procedure not used in the clinical laboratory but essential to the research project. This was the measurement of the partial pressure (tension) of oxygen and carbon dioxide gases dissolved in blood samples. Special electrodes are employed today for this purpose, but they had not been perfected back in 1960. Rather, only a very delicate manometric but archaic method was available (Riley bubble technique performed in a water bath using a microscope). Jack researched how to construct this apparatus and then proceeded to teach Bob's wife Estelle how to use it. Thus, as so often in her life, she joined Bob's research team for this heroic project.

Early on the morning of July 3, an 18-wheel cattle truck loaded with those 10 steers, 12 lambs, and 8 tons of hay plus sacks of feed pellets made its way from Denver west to the narrow, winding mountain road that leads to the summit of Mount Evans. All of this cargo had to be transferred to a pickup truck and hauled over to the portable corral prepared by Bob and Jack. Back and

forth, back and forth, one steer at a time, etc., then the lambs, and finally the feed were placed in the corral. Fortunately, some of the other cardiology fellows from the lab were on hand to help.

Unnoticed, the truck driver had been stricken with acute mountain sickness and was restlessly awaiting the moment when he could get the hell



Figure 34.2: *The corral near the summit of Mount Evans.*

off that mountain. Jack noticed him just in time to see the driver climb into his cab and start the engine. He was bent on getting that empty 18-wheeler down that winding mountain road as fast as possible. Jack jumped into his own car, sped ahead of the truck, and with lights flashing, horn blowing, Jack managed to warn oncoming traffic of this very dangerous wild man weaving close behind him. Cars pulled onto the shoulder of the road despite the sharp drop off, and potential collisions were avoided. Later, Jack said he had never been so scared in his life. And thus a day never to be forgotten had ended. (*See Appendix, Document #2, Jack Reeves' account of the Mount Evans Project.*)

This ambitious project was carried off on a financial shoestring from Blount's unused grant money. Bob and Jack paid all of their own expenses, used their own vehicles, and devoted endless hours to making it a success. Fortunately, Bob and Estelle owned a 1958 4wheel-drive three-quarter-



ton GMC Carryall that became the indispensable workhorse throughout the project. Once again, the mountain phase of the project necessitated key personnel to spend the night prior to a long day's work at the research station 2,000 feet below the tree line. While Bob was able to juggle some of the diagnostic work to free up additional research time on a Friday or Monday, virtually this entire project was conducted on personal time at personal expense. That is the answer to how research was funded: sometimes out of your own pocket.

While this project was phenomenally successful and was the benchmark for many to come, it did have one totally unexpected byproduct. With great and justified pride, Bob and Jack shared with Blount their mass of data on pulmonary hypertension as it came together, and they urged him to visit the corral laboratory on the mountain. But never once did he see it. He was happy



Figure 34.3: *Studying pulmonary hypertension in a 500-lb steer at 12,700 feet altitude.*

to have his name added to the list of authors on the many publications that came forth; it was policy that he would appear on anything published from his Division of Cardiology.

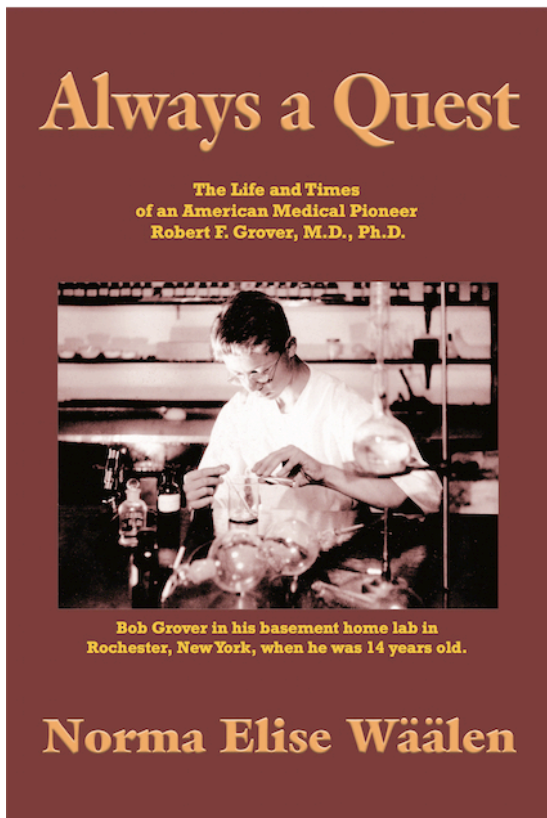
Fieldwork on this project was completed as Jack had just entered his third year as a research fellow working with Bob. The two of them had proven to be a powerful research team and had developed a strong friendship. They were excited about their future and were already making plans for their next venture. Who could have foreseen that at the end of Jack's third year of training, he would be forced to terminate his association with the University of Colorado School of Medicine and leave Denver, not to return for 11 years? Some major event must have caused this precipitous action, but what could it have been?

It happened like this. Approximately 2 months after the conclusion of the Mount Evans project, Blount called Jack into his office alone. Afterward, Jack came to Bob and told him Blount had accused him of stealing his grant money. Jack was incredulous! He and Bob, as well as Blount, knew Blount had willingly agreed to the use of his idle grant money and acknowledgement of that appeared at the end of every publication. Then, for him to accuse Jack of stealing—why would he do such a thing? One can only speculate. He gave no explanation.

Sadly but firmly, Jack told Bob he could no longer work under Blount, and at the end of his cardiology fellowship in June 1961, he and his family moved back to their hometown of Lexington, Kentucky.

That is the little-known reason why Jack and Bob parted, but only geographically. Their deep friendship was not shaken. They remained in close contact, even collaborating on subsequent research projects. Eventually, after 11 years, they were reunited. Bob had received funding that allowed him to offer Jack a faculty position—with the approval of the Chairman of the Department of Medicine as well as Blount, himself, the Head of the Division of Cardiology.

Jack had said, "If I could have just 10 more years with Bob, my life would be complete." He got his (and Bob's) wish. The two of them remained a powerful team working in collaboration not only until Bob retired as director of the lab but also afterward, until Jack's death in 2004.



*Robert Grover is a living legend in cardiovascular pulmonary research. He and his first wife Estelle conducted research in the highest places on three continents. In his Denver lab, he trained many of today's leading researchers. Read about the scientist outside the laboratory, from Colorado cabin to Mount Everest.*

## **Always a Quest**

by Norma Elise Waalen

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