Rocky Mountain Laboratory: A Monument to the Tick

Hamilton, Montana. "This is sort of like a Shangri-La here," said zoologist Lyle P. Brinton as he pointed toward the snowy, serrated mountains to the west. Whether paradise or not, the National Institutes of Health's Rocky Mountain Laboratory is without doubt one of the most remote biomedical research facilities in the country.

Hamilton, a town of some 2500 ranchers, loggers, and scientists, is located 45 miles south of Missoula, in the spectacular Bitterroot Valley of southwestern Montana. With one radio station, one movie theater, and one bookstore, which stocks only right-wing titles, Hamilton is hardly Montana's most sophisticated metropolis. Nor is Missoula, whose commercial airport links the Bitterroot Valley to the wider world, a particularly easy place to reach.

Such isolation has some effect on the laboratory's operations. For instance, the laboratory raises almost all of its experimental animals—about 300,000 annually—primarily because it cannot depend on aerial shipments from commercial suppliers. In winter, bad weather sometimes closes the Missoula airport for days on end, leaving shipments of rabbits or mice from the East languishing in Spokane or Seattle.

Despite its isolation, the laboratory maintains an active, modern program employing 145 workers, 26 of whom are doctoral-level researchers. The facility is the largest of the ten laboratories in NIH's Allergy and Infectious Diseases Institute.

In the laboratory's early days, Director Herbert G. Stoenner relates, the Hamilton city fathers required that a moat be dug around it, in order to prevent disease-laden arthropods from escaping to infect the town. Five of the laboratory's pioneer scientists died from diseases connected with their research. In addition, the laboratory abolished high school tours several years ago, after a few students came down with Q fever. Today, however, residents of Hamilton express no fear of disease originating from the laboratory. Rather, Hamiltonians are gratified that the laboratory, the town's biggest employer, pours money into the valley. Furthermore, as one resident says, "The lab gave Hamilton its status."

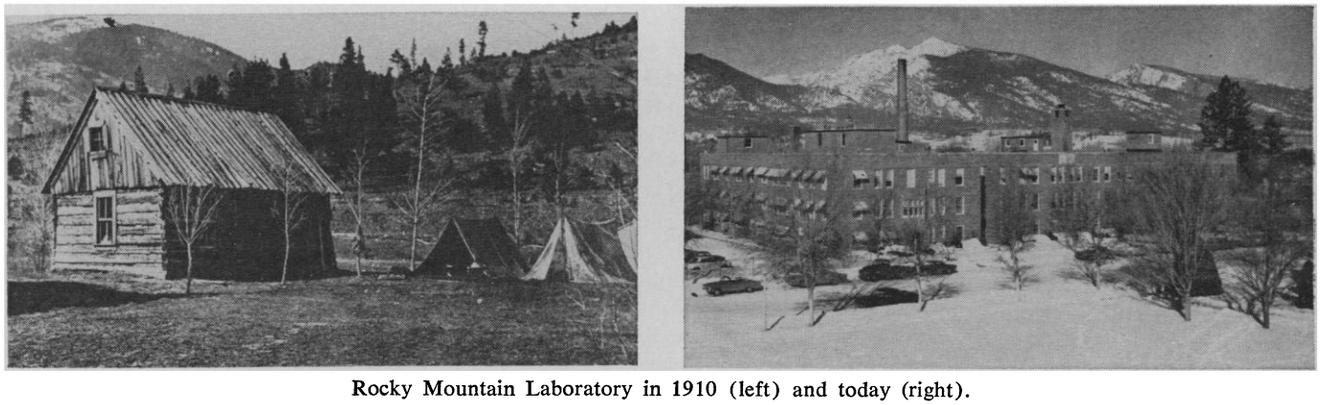
The location of the laboratory is a monument to the lethality of the Rocky Mountain wood tick. After this valley was settled in the late 19th century, dozens of people began dying annually from Rocky Mountain spotted fever caused by the microorganism *Rickettsia rickettsii.* This fever is common to the western states, and in the past 40 years it has spread to the eastern states; about 80 percent of those who died from it, however, contracted the disease in this part of Montana. Also, about 80 percent of the people who contracted the fever in this area in the early 1900's died from it. (Now, about 5 percent of the Americans infected with the disease are killed by it, and these deaths are due primarily to many physicians' unfamiliarity with its symptoms.)

Although the lethality of Rocky Mountain spotted fever has been greatly reduced, partly due to the work in this laboratory, scientists have never been able to discover why the disease was so prevalent, and so much more virulent, in this valley. Stoenner points out that all the lethal cases in the valley were caused by ticks west of the Bitterroot River.

Some Montana Indians thought the fever to be caused by tick bites, but early white settlers tended to believe it was due to drinking water from melted snow. The Indian assumption was finally confirmed after 1906, when Howard Taylor Ricketts successfully induced Rocky Mountain spotted fever in a guinea pig and showed that ticks feeding on a sick animal could transmit the fever to a healthy animal. The rickettsial diseases (spotted fever, Q fever, scrub typhus, typhus, and others) were named for Ricketts, who himself died from typhus.

Pressure for action on spotted fever increased after 1921, when a prominent Montana state legislator and his wife were killed by the disease. The building of the laboratory was the result primarily of pressures exerted on the state and federal governments by citizens of Montana. The fight against spotted fever was an unusual joint effort of the state government and the U.S. Public Health Service. Montana provided the funds for the building of the current laboratory complex, which was then turned over to the Public Health Service in 1928.

The vaccine that Public Health Service scientists developed here from infected ticks was widely used for more than two decades, until the appearance



Rocky Mountain Laboratory in 1910 (left) and today (right).

of broad-spectrum antibiotics made Rocky Mountain spotted fever much more susceptible to treatment.

In addition to making spotted fever vaccine, the laboratory also made yellow fever vaccine during World War II. The agent causing Q fever was isolated here, for the first time in the United States, and an experimental Q fever vaccine has been made at the laboratory. The Ribi press, which is used to rupture the cell walls of bacteria, was also developed here.

Part of the laboratory's work is concentrated on rickettsial diseases, and the building houses what is termed "the world's most complete tick collection" —800 species. The laboratory is one of the two places in the world where ticks can be identified; the other is a laboratory supported by the U.S. Navy in Cairo, Egypt.

Interest in diseases carried by ticks seems to be even more pronounced in areas outside the United States. "We have a lot of visitors from Eastern Europe, where many people inhabit tick-infested areas," says Steven Harris, a physician assigned to the laboratory. "We have only a small number of people in Montana, so who cares whether a few people get bitten by ticks. European scientists are much better informed about ticks than many Americans."

Since 1948, however, the scope of the laboratory's work has been expanded beyond the study of the diseases carried by ticks. Primary emphasis is now placed on the immunology of tuberculosis, on molecular biology, on medical entomology and acarology, and on the pathogenesis of four slow viral diseases—scrapie and progressive pneumonia in sheep, and Aleutian disease and encephalopathy in mink. Researchers at the laboratory hope that their work will eventually be useful in helping understand such illnesses as multiple sclerosis, Parkinson's disease, and cancer.

Scientists say that an important reason for their liking to do research at the Montana laboratory is the very high quality of the technicians. Many technicians are older men, veterans who came here when the laboratory expanded after World War II. Stable, high-paying jobs are scarce in the Bitterroot Valley, and the turnover among technicians is low.

Researchers say that the atmosphere is "very good" for scientific work. Scientists say they like the lack of red tape that a relatively small laboratory makes possible. "One doesn't have to waste time with formalities," Harris comments. "People here are able to work closer to an 8-hour day than in any other lab I've seen."

However, some of the personnel regret Hamilton's small size and isolation. Many of the scientists are older men; one young researcher complained that Hamilton had few young families and that he missed the challenge of graduate students. (There are some connections between the laboratory and the University of Montana at Missoula.)

Harris, who describes himself as "the only Jew in town," says that the nearest synagogue is 250 miles away in Spokane, Washington. Harris adds, "I don't know whether I want my kids growing up in a place where they won't know what a Negro is or that there are times when you have to lock your car doors."

Fairly Conservative Town

Hamilton appears to be a fairly conservative town, in which the John Birch Society is reported to have attained a good deal of influence. Scientists and their wives sometimes get into arguments with local residents over issues that are controversial locally—for example, conservation, clear-cutting U.S. Forest Service timberlands in the valley, and sex education in the schools.

One scientist describes Hamilton as "a town with a lot of religious zeal" and "a town where they don't know what a real liberal is. What they call a liberal here would be called a Southern Democrat anywhere else." In recent years, some of the laboratory's scientists have been defeated when they ran for positions on the local school board. (The laboratory staff generally gives high marks to Hamilton's school system.)

Staff members are a little reluctant to make their criticisms of the town in public. "You just don't come in here and knock the Bitterroot," says one who asked that his name not be used. "You've got to be kind of careful or people will think that you're trying to act better than the Hamiltonians."

"Frankly, there's no culture here," confides another, who asked that he not be identified. "There's only the Elks Club and the golf course. Besides that, everyone is a loner around here."

But life in the Bitterroot Valley has other compensations. "People who want culture go elsewhere," says Stoenner, "but that doesn't mean we don't have any culture." The scientists talk of the many outdoor advantages of living in Hamilton, which is 10 minutes from the Montana wilderness, and of a climate that is mild in both summer and winter. Stoenner says that he is able to play golf every month of the year on the town's nine-hole course. Brinton says that he "pours it on" in his research from November to April, because he knows that it will be a little harder to work during the idyllic Montana summer and fall.

Because of such bucolic advantages, Stoenner says, there is no trouble finding good researchers who are interested in their science—"They're looking for a decent place to live, away from crime and violence." Lest the laboratory be flooded with applications from those tired of cities or of universities, it should be pointed out that the Rocky Mountain Laboratory, like other government facilities, is in a period of forced retrenchment because of the financial squeeze. The laboratory has been able to hire very few new permanent staff members in the past 5 years, and has lost four scientists during the last year.

But on that future day when scientists can once again command a seller's market for their talent, perhaps they can persuade the government agencies to establish more research labs in spectacular natural locations. For, as one scientist noted, there are few nicer ways to analyze a problem in one's lab than to contemplate it as one watches the sun set behind the precipitous peaks of the Bitterroot Range.—BRYCE NELSON

Bryce Nelson, a former member of the News and Comment staff, is a roving national correspondent for the Los Angeles Times *and is based in Chicago.*

APPOINTMENTS

Bernard R. Gelbaum, professor of mathematics, University of California, Irvine, to vice president for academic affairs, State University of New York, Buffalo. . . . **Ernest A. Boykins**, professor of biology, Alcorn A & M College, to president, Mississippi Valley State College. . . . **Donald Schwartz**, dean for advanced studies, Florida Atlantic University, to vice president for academic affairs, State University of New York, Buffalo. . . . **Carl D. Riggs**, dean, Graduate College, University of Oklahoma, to academic vice president, University of South Florida.