

# **ARCTIC AEROMEDICAL LABORATORY**

Arctic Aeromedical Laboratory

## **LINEAGE**

## **STATIONS**

## **ASSIGNMENTS**

## **COMMANDERS**

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The Arctic Aeromedical Laboratory

In 1947, the new Air Force organized its Arctic Aeromedical Laboratory under the umbrella of the School of Aviation Medicine at Randolph AFB, Texas. The unit moved to Ladd almost immediately, and a year later came under the direction of the Alaskan Air Command. The lab operated until 1967. Its general missions were to address the AAC's problems of human adaptation to the Arctic, and by extension, to assist all of the armed services in adapting to the environmental conditions of polar theatre warfare.

In its earliest years, the lab performed research in areas such as cold weather equipment, survival rations, acclimatization, and morale. Initially, the unit used temporary quonset huts for its facilities. In spite of the importance of its mission, it often struggled to obtain resources and supplies.

By 1955, the lab operated out of a four-building complex across from the new hospital. The main laboratory building housed offices, a library, and two floors of laboratories. In the rear stood a materiel warehouse and office. Next to that, a structure housed a fabrication shop for woodworking and sheet metal projects as well as a small-animal colony. A flammable storage facility rounded out the site. In the late 1950s, the lab also had two satellite facilities. The "River Lab" was a quonset hut in an undeveloped section of the post along the Chena River. It served as a staging area for field tests and large animal work as well as quarters for visiting contract scientists. The "Bridge Lab" located near the Trainer Bridge added more work space. It consisted of temporary buildings which were formerly the base veterinary facility. However, as the lab staff pointed out, all of Alaska and even the Arctic basin were extensions of the lab due to its emphasis on studying actual field conditions.

By the latter 1950s, five departments conducted in-house research, and the lab also supported visiting contracted researchers. As of 1959, researchers also cooperated with four other Alaska-based Arctic research organizations: the Arctic Health Research Center, the University of Alaska, University of Alaska's Geophysical Institute, and the Naval Arctic Research Lab at Point Barrow.

Arctic Aeromed's Environmental Medicine Department focused mainly on diseases, preventive medicine, and sanitation. Its staff studied water purification, sewage disposal, frostbite, and bacteria and viruses. They also researched defense against chemical and radiological warfare in the Arctic, and countermeasures for possible Arctic biological warfare. They expressed interest in studying ancient microorganisms frozen in the Arctic ice, and in the development of photosynthetic gas exchange systems to provide oxygen for space travel.

The Physiology Department directed its studies toward three areas: cold acclimatization, acute cold exposure, and hypothermia. The acclimatization projects included efforts "to study all groups of people in the world who are habitually exposed to extreme cold" and included metabolic studies on Alaska natives as well as controlled experiments on members of the armed forces. The intention was to determine whether acclimatization could offer "significant protection" to military personnel in the Arctic. Studies on acute cold and hypothermia dealt with the inevitable risks of severe cold exposure. Several projects observed cold exposure in animal subjects such as dogs, rabbits, and hibernating squirrels.

The Biochemistry Department investigated biochemical responses to cold, cold weather metabolism, and developed and tested cold weather rations. The Department of Protective Equipment field-tested clothing and equipment for Arctic use, applied scientific methods to clothing design, developed prototypes, spot-checked the survival training programs, and disseminated its findings by sponsoring conferences within the Alaskan Air Command. A small Department of Psychology oversaw research on issues such as morale, the vigilance of radar scope operators, the effects of cold on mental performance, the problems of isolation at remote duty stations, and even the psychological stress of handling missiles in a cold environment. Figure 14. Military Test Subjects, AAL Personal Equipmentment.

The Arctic Aeromedical Lab was an important contributor to Arctic science in the 1950s, in both military and civilian arenas. Responding to its mission to increase the Air Force's operational

capabilities in the far north, the lab's research led to improvements in cold weather clothing and survival equipment, treatment of cold injury casualties, and other aeromedical advances. Scientists from the lab regularly participated in the annual Alaska Science Conferences, and in 1957 hosted a joint U.S.- Canadian Conference on Cold Injury. The Lab published a substantial amount of research results in technical notes and reports. Even now, the lab's basic research on cold adaptation is still cited.

Another legacy of the lab is the controversy over an experiment with Alaska Native subjects. In 1993, concerns surfaced about a 1957 iodine-131 experiment on thyroid function. Both the National Research Council and the North Slope Borough investigated the study, interviewed participants, and published reports in 1996 and 1997 respectively. The details of the controversy are beyond the scope of this study, but the substantive ethical questions and cross-cultural issues raised by it are likely to remain part of the historical fabric of the Air Force's Cold War presence at Ladd.

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