Arctic Aeromedical Laboratory

In 1947, the U.S. Air Force created the Arctic Aeromedical Laboratory. Its mission was to provide military forces with advanced equipment and knowledge to survive and succeed in the Arctic.

In March 1947, the U.S. Air Force created the 1st Central Medical Establishment at the School of Aviation Medicine at Randolph Air Force Base, Texas. This was soon renamed the Arctic Aeromedical Laboratory (AAL) and moved to Ladd Air Force Base, Alaska where it was reassigned to the Alaskan Air Command. At Ladd, the AAL was tasked to solve the severe environmental problems of men living and working in the Arctic.

Projects conducted by AAL scientists ranged from the peculiar and technologically advanced to the practical and nature-based. They included simulated survival scenarios that evaluated equipment and investigated resources available in Arctic regions. The AAL was not without controversy, however. From 1955-1957, a thyroid study involved military personnel and non-military civilians, including members of the Alaska Native community, who were given iodine-131 which emitted radiation and resulted in citizen concern for decades.

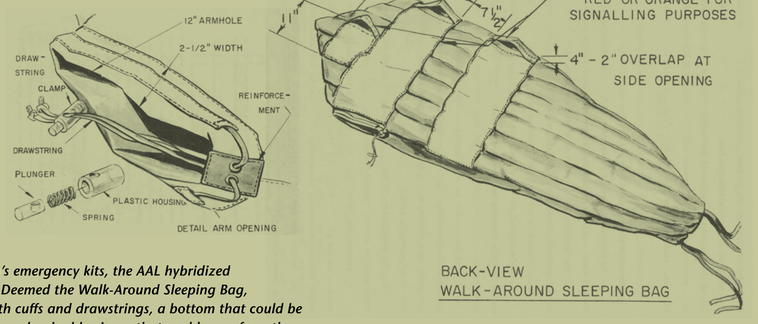
The AAL garnered recognition for contributions to military preparedness in cold environments. Its work remains relevant as researchers continue to utilize AAL findings when conducting modern arctic studies. When the AAL closed its doors in 1967, it had significantly improved the military's capability to wage war in the Arctic by providing military personnel with the knowledge needed to survive and excel.

During its 20 years of work, the AAL explored all nature of the Arctic-human interface through five departments.

"Our first task in training men for the Arctic service is to dispel the cold bugaboo, show them that they need not freeze or even suffer from the cold if they follow instructions and use their equipment and their heads." Colonel Jack Bollerud

Working to increase the survivability of airmen when downed in the wilderness, the AAL developed devices like the Search and Rescue and Homing (SARAH) location marker and the pocket pen flare—a compact flare device that could be safely carried in separated parts in a uniform sleeve pocket. The compact flare would function when cold-soaked to -70 F and soaked in water for up to 15 hours.*

The AAL studied heat loss of the body, trying to refine the importance and improve the quality of various items of clothing. Researchers covered or uncovered various body areas—torsos, heads, hands, and feet—with garments of varying thickness and then exposed subjects to extreme cold while measuring body temperature. They concluded that the greatest cold tolerance required the hands and feet to have adequate protection and insulation.



To reduce the weight and bulk of airmen's emergency kits, the AAL hybridized the standard sleeping bag and a parka. Deemed the Walk-Around Sleeping Bag, modifications included arm openings with cuffs and drawstrings, a bottom that could be tied around the waist to enable walking, and a double zipper that could open from the top or bottom, inside or outside.

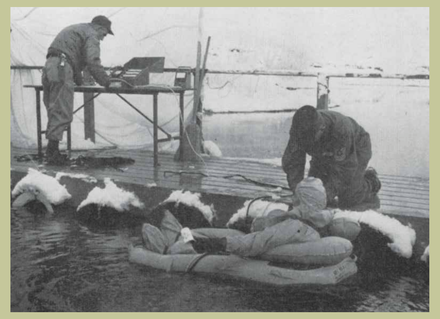
The Department of Environmental Medicine studied etiology, pathology, treatment, prognosis, and prevention of diseases military personnel might encounter in the Arctic.

The Department of Physiology focused on how the human body adapts to the cold. Its experiments sought to understand cold acclimatization, short-term effects of cold, and hypothermia.

The Department of Biochemistry investigated nutrition in the Arctic, the biochemical adaptation to cold, and the harmful effects of cold.

The Department of Protective Equipment, initially known as the Special Projects section, tested and evaluated experimental survival equipment and clothing.

The Department of Psychology investigated the problems and effects of living and working in the Arctic, provided information on mental abilities needed to adapt to life in the Arctic, and recommended solutions to improve living conditions.



Drowning or exposure were the second leading causes of death for downed flight crews. The anti-exposure flying suit was designed to allow body vapors to escape while keeping cold waters from influencing body heat loss. It was tested using the icy waters of the Chena River.

Prior to World War II, Ladd Field's mission was to support the Cold Weather Test Detachment (CWTD). The mission of the CWTD was to test equipment, supplies, and vehicles in the Subarctic. The goal was to increase success and survival of war-fighters in cold climates.

With the rise of the Cold War, this mission increased in importance and was pursued at Ladd Air Force Base. The Arctic Aeromedical Laboratory was responsible for a wide variety of technological, psychological, and physiological advancements in military equipment and preparation. Its scientists were given license to study anything they determined might give the nation's military an advantage in the Arctic and Subarctic.

In 2000, Building 4070 was determined eligible for inclusion on the National Register of Historic Places because of its connection to the Arctic Aeromedical Laboratory which contributed to Alaska's key role in the Cold War. In the 1970s, Building 4070 became the home of the Cold Regions Research and Engineering Laboratory (CRREL) and continued to host cold climate research activities.