

## ANDEAN MAN & THE ASTRONAUT: EXCLUSION BY INCLUSION IN EARLY SPACE MEDICINE

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**Introduction:** To foster lasting inclusion, diversity, equity, and accessibility in space fields, it is crucial to have an understanding rooted in the humanities and social sciences of how these came to be problems requiring our urgent attention in the first place. A deeper understanding of the past can help us make more informed decisions in the present and the future. Based on historical research in U.S. Air Force (USAF) and National Aeronautics and Space Administration (NASA) archives, this project turns to very early space medicine research conducted in the 1950s to examine how an entire group of humans were disqualified from spaceflight.

In 1958, Bruno Balke, a former German Luftwaffe doctor working for USAF, led a team of airmen up Colorado's Mount Evans for a six week long experiment near the summit at 14,000 feet. Could acclimatization to the thin mountain air via intense physical activity boost the oxygen efficiency of future astronauts living in artificial low-pressure spacecraft environments? To judge their improvement, Balke, an expert in the nascent field of space medicine, compared their performance not with military test-pilots, but with high-altitude Indigenous people he had studied in the Peruvian Andes.

This project expands existing discussions of diversity and inclusion beyond their traditional focus on NASA in the 1960s U.S. Civil Rights era and the slow integration of women and visible minorities into the astronaut corps and space sciences. This earlier case from the pre-NASA era in the 1950s puts a focus on the permanent residents of Morococha, Peru, who participated in an effort to define an ideal spacefaring body. More than recovering the story of a nearly forgotten group of astronaut-adjacent test-subjects, this project shows how racial discrimination in space medicine and exclusion from spaceflight functioned *by inclusion*.

Balke studied and even celebrated the bodies of Morocochans, but he never considered them as potential astronauts. Even though he was very interested in the remarkable altitude tolerance of Morocochan miners, and even believed they were particularly well-suited for space, he never contemplated or suggested including them as potential astronaut candidates. His plan was always to “train prospective crewmen as closely as possible to the physical standards of these natives.” Balke assumed the category of “astronaut” was reserved for white men in excellent physical condition and structured his studies in a way that ensured this outcome.

This project connects Balke's little-known space medicine research for the U.S. Air Force in the Peruvian

Andes to his later attempt in the summer of 1958 to replicate the abilities of the Morocochan miners in white American airmen on Mount Evans. Balke's approach reduced Morocochan miners to useful human material required to physically perfect white military men for space. Recovering Balke's work places the high-altitude Indigenous person and the mountaineer alongside the familiar figure of the pilot in the genealogy of the early American astronaut. It also focuses our attention on how—counterintuitively—inclusion in space medicine studies can lead to exclusion from space. It shows how beyond previously-identified social and institutional barriers to access, additional barriers can exist within medical knowledge of the human body itself. This perspective on how a lack of IDEA principles can appear through the targeted inclusion of marginalized and vulnerable populations can guide future efforts to increase diversity and equitable access to space.

