Sweating and Dousing
Designing Climate-humanist Architecture and the Arctic Worker

Lasse Rau

> "Hell is hot. Did you ever wonder why?"
> — Joseph Russell Smith [1]

The discovery of Alaskan oil in 1968 and the ensuing economic integration of the American Arctic renewed the importance of cultural and climatic studies of living in the North.[2] With international oil companies prospecting in the North Slope region of Alaska, the land claims of the recently inaugurated state, its Native inhabitants, and private investors underscored the lack of a settler-colonial legal framework of land ownership and of architectural techniques for aiding settlement in vast swaths of the territory.[3] Together with the looming oil crisis of the 1970s, these events launched a debate on the legal, cultural, and spatial effects of development throughout the American Arctic. Intending to protect Alaskan society from changes that could cause overcrowding, unvirtuous wealth, and potential criminality, pipeline planners reassured state and federal officials that the effects of the pipeline would be temporary. For their planners, worker camps acted as a control mechanism to conceal the pipeline's cultural, economic, and societal impact by functioning as temporary structures that would climatically and culturally support workers throughout construction and operation.

The development of oil and mining industries alongside military research labs, fortifications, and radar systems demanded not only physical capital but also human capital to be imported from elsewhere. Their construction and service demanded the expertise of a workforce that was seen as lacking within the Arctic context. Operating in a hostile environment that would even "choke the perfection out of machines,"[4] governmental and industrial planners apprehended the effects of geographic, cultural, and climatic change on workers whose efficiency was much more brittle than any piece of equipment.[5] In their first full-scale article on the ongoing arctic development of oil in Prudhoe Bay, Alaska, the *New York Times* made racialized generalizations, associating Native northerners to caribous, wolves, and grizzly bears by saying "only these have ever learned to survive in this treeless, trackless wilderness where temperatures plunge to minus 50 degrees Fahrenheit."[6] Defining Native northerners as a "species" separate from the southern "oil man" and as integral parts of the inhospitable landscape that had to be reckoned with, the article revealed a discourse of thermal and social conditioning adopted by planners operating in the Arctic.[7] Although retaining the same rhetoric of climate-cultural

amalgamation as previous military expansions, the scale of this discourse during the oil rush moved from experiments on the adaptation by culturally different bodies to the climatic design of architectures as cultural projects of assimilation. Ultimately, this concealment of bodies transpired through the codification of comfort, climate, heat, and cold.

Links between cultural origins and bodily effects emerged from a necessity for Native assimilation and utilitarian demand in colonial settlements through the nineteenth and early twentieth centuries. The

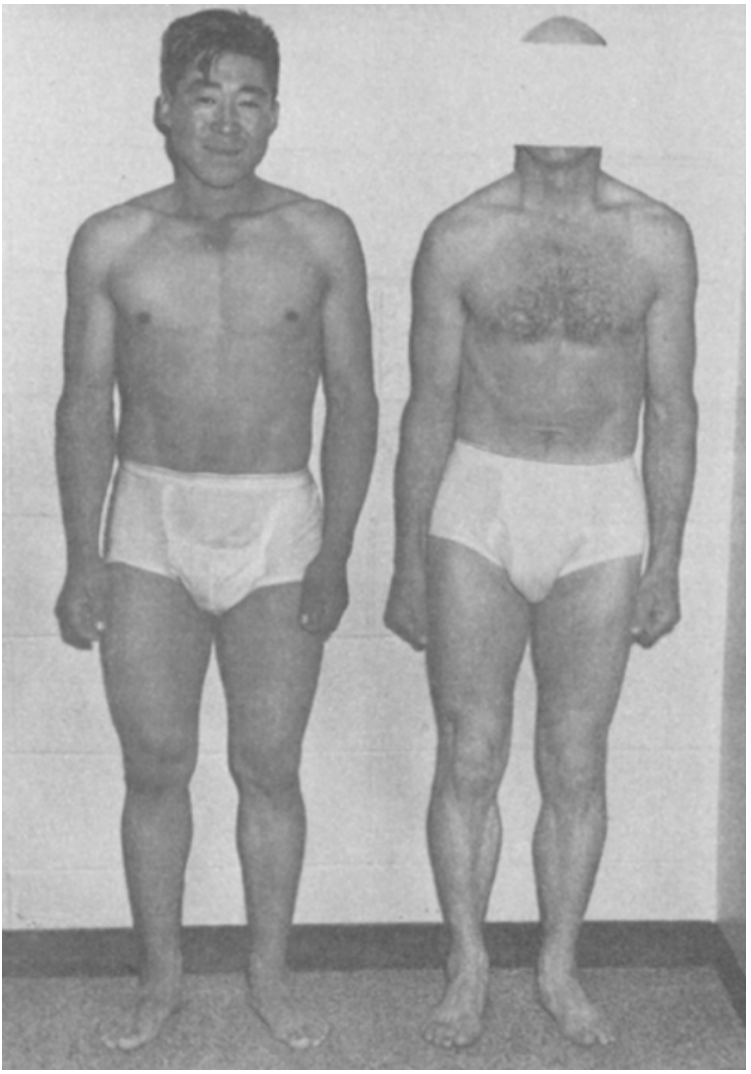

Figure 1
C. J. Eagan, "Biometeorological Aspects in the Ecology of Man at High Latitudes," *International Journal of Biometeorology* 10, no. 3 (December 1966): 298. The face of the person on the right appears to have been physically redacted from the photograph prior to the publication of the article to hide the military personnel's identity. The privacy of the Native subject was not taken into consideration.

physiological and psychological deficiencies of European settlers, troops, and administrators in the face of unfamiliar climates hindered the long-term growth of colonies, while imported ailments and what were regarded as "cultural differences" abated the chances of assimilating colonized populations.[8] By studying the medical characteristics of colonial subjects, scientists partaking in explorations to the Americas, Asia, and Africa tactically merged efforts in assimilating local populations with the biological support of colonial emigrants.[9] The trope of acclimatization that was used to explain the effects of tropical climates on white bodies was also embraced by early researchers studying the effect of Arctic weather on its inhabitants.[10] Yet without the support of a development project in the Arctic, initial biomedical studies produced during missionary explorations of Alaska, Greenland, and northern Canada lacked the practical application of their tropical counterparts.[11] Ultimately, the development of military bases and petroleum facilities in Alaska in the postwar years supported practical research that established relationships between culture, bodies, and their built and natural environments.

Performing Comfort

To provide solutions to the "practical problems facing man as a biological organism" following the military expansion in the Arctic during and after the Second World War, the US Air Force Arctic Aeromedical Laboratory (AAL), located near Fairbanks, Alaska, employed medical scientists, engineers, and military staff.[12] Located in an area that could reach -50 degrees Fahrenheit and, more importantly, near "neighboring military installations and nearby aboriginal communities [that could] serve as reliable sources of supply for experimental subjects," the laboratory supported research valued by planners seeking to house southern personnel in the North (Fig. 1).[13] A result of the militarization of the Alaskan territory in the 1940s and 1950s, the laboratory's research ranged from the thermal study of bodily conditions by measuring the heat characteristics of animal extremities and recta during performance to the sweat rates of male Native northerners and southern military staff.[14] To ascertain the latter, subjects categorized by nutritional choices and economic occupations were asked to perform nude treadmill exercises and walk around "dressed in … standard Air Force clothing" at freezing temperatures.[15] To understand the biological extent of cultural and racial differences, AAL staff tabulated the number of "active sweat glands" per square centimeter of the subjects' foreheads while measuring changes in their skin temperature, weight, and respiratory heat.[16] In other instances, researchers immersed Native and military subjects into heat-controlled water baths and monitored the temperature of the bodies through an "indwelling catheter type thermistor [that] was inserted 10 cm into the rectum and secured to the buttock

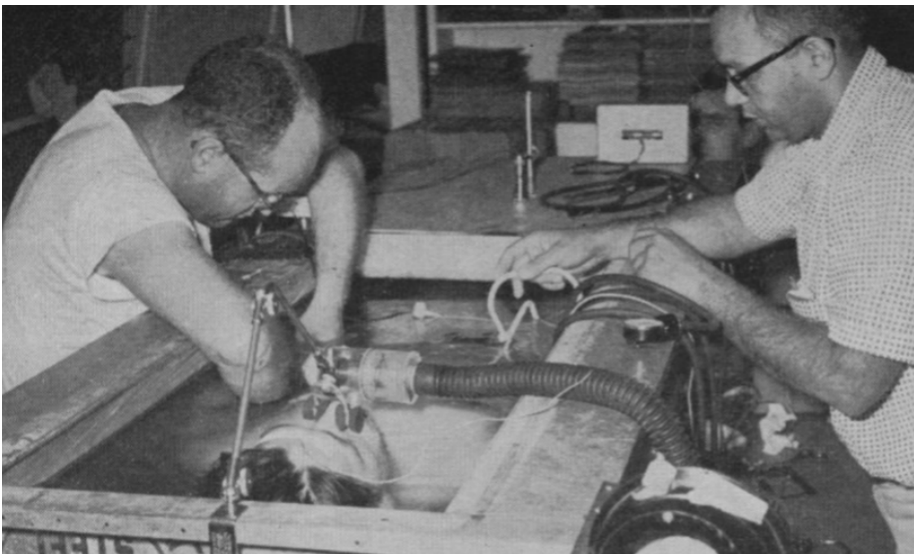

Figure 2
H. F. Drury, "Arctic Aeromedical Laboratory, United States Air Force," *BioScience* 14, no. 5 (1964): 50.

by water proof tape."[17] Through such surficial and invasive experiments, AAL researchers defined both extreme limits of cold pain and the related "comfort zone" of their culturally different subjects (Fig. 2).[18]

The studies further linked these definitions of comfort to specific notions of thermal cover: whether Native clothing, makeshift military structures, or permanent architectures. During an AAL symposium in Fairbanks, Arctic physiologist Laurence Irving reported his field research on the Nunamiut people, in which he explained that "it was no problem to get [Natives] to sit outside in air temperatures just below freezing with bare hands while we observed them from the comfort of their sod house."[19] But while these Native architectures were deemed sufficient to provide temporary shelter for southern researchers and to climatically sustain Native bodies, the southern advantages of "air-conditioned houses"[20] and "sheltered urban life"[21] were expressed in terms of cultural adaptation and progress.

Throughout, the studies of biological adaptation conjoined productive, male, working bodies, their natural and cultural landscape, and their shelters as part of the same experiment.[22] By linking occupation, legal indigenous status, and bodily responses, AAL researchers attributed the climatic adaptation of the different sweat rates of each male, Native subject to "*his* integration into the culture and economy of the civilization which has invaded *his* homeland."[23] Combining climatic comfort with cultural and economic status and the repression of indigeneity, AAL's experiments enabled the bodily comparison of subsistence-based lifestyles

and a preference for "cold" with the imported economy of military bases and oil extraction.[24] In contrast to the Native subject's productivity in cold environments, the same climatic terms were proposed to combat sexual and gendered "behavior…regression" that presented "man's, or more correctly, woman's vanity, explicit in sheer nylon stockings in 40° C below weather, readily observable in the streets of Fairbanks every winter."[25]

Depicting Native northerners on the frontier of climatic, cultural, and economic extremes, the AAL anticipated the cultural turn in northern development at the outset of the 1970s, which critiqued the positionality of southern researchers while still reinforcing their view of northern culture.[26] Instead of providing support to groups deemed economically and socially under-developed, researchers claimed to provide biomedical remedies to cold, such as radioactive treatments and changes in diets, through the guise of acclimatization.[27] Rather than negate the power relations of development, attunement to climate and ethnicity provided the basis for a new colonial claim of expertise predicated on scientific evaluation. Scientists at the Laboratory thus positioned themselves at the forefront of research surrounding landscape, climate, and culture, combining various disciplines such as medical research, anthropology, and architecture.[28] Beyond producing military expertise that viewed Alaskan landscapes along with its Native and imported inhabitants as a "natural laboratory,"[29] AAL's climatic measurements placed alongside preconceived cultural characteristics informed a techno-social and humanist architecture that flourished in the 1970s.

Locating Culture: From Bodily to Climatic Skins

In spite of AAL's impact on Arctic acclimatization studies, initial exploration and construction camps for Arctic oil explorations replicated the temporary trailer structures of mainland military camps. Assembling camps on-site from standardized bunk trailers into large "cities," planners focused less on the architectural qualities of spaces and instead resorted to bureaucratic mechanisms of "city-building" regulated by zoning patterns, hygienic policies, and aesthetics of legibility. These approaches borrowed the rhetoric of climatic survival central to prior Arctic high modernist city proposals, such as Frobisher Bay and Inuvik.[30] Their architectural elements and urban forms were nonetheless promoted as universally applicable for the housing of workers, military forces, and convicts in any "faraway" place, such as "Vietnam, Pakistan, Argentina, the Antarctic, Alaska [or] Sumatra."[31] However, with lawmakers' increasing examination of the unvirtuous and highly visible impact of Arctic development throughout Alaskan society, planners of worker camps suggested new methods of concealment to distance camps from similar scutiny. Local and national coverage lamented the loss of indigenous culture and reported an increase in sex work, drug use, and uncontrolled development. In this

environment, planners presented accommodations—including their construction, interiors, and programming—as potential tools for mitigating the social, environmental, and economic impact of unprecedented growth.

Fighting against what were termed "city problems" in Alaskan towns and camps, corporate planners sought to employ architecture to manufacture constituencies within a heterogenous and transient worker population.[32] Health advisors to oil companies increasingly argued that northern workers' isolation and special housing situations required companies to "provide for the total care of the employee and maybe, in due time, *his* family."[33] Instead of supporting workers with the bare necessity for bodily survival, planners considered that:

> Astrodome-like communities, perhaps elevated on thermopiles, that incorporate the efficiency of central utilities, but through design and sound barriers achieve privacy, seem to be a necessity economically and from a health standpoint. It must be kept in mind that the employee of today does not work for "bread alone."[34]

This rhetoric of providing comfort, community, and cultural conditioning through climatic design piqued the interest of a novel group of architects. During a conference organized by staff from the Arctic Aeromedical Laboratory in 1970, architect Edwin B. Crittenden criticized the military-style "barrack type buildings" of previous Arctic camps as neglecting a "design" for "human needs."[35] Crittenden, trained at MIT, questioned whether their minimal architecture would be able to respond to the cultural and climatic needs of the "housewife with six children" in addition to the "drilling crew…looking for a cool beer."[36] Beyond expressing a critique of the architectural qualities of cultural conditioning, Crittenden sought to distance himself from the modernist notions that solicited the production of an ideal body to fit within the architecture.[37] Part of an emerging generation of US architects educated during the early postwar years, his interests lay in redefining the architectural elements that condition psychological and thermal comfort.[38]

Akin to Crittenden's emphasis on comfort as an outcome of architectural technology, architectural historian Reyner Banham observed that the role of culture in architectural production decreased once climatic considerations—materialized through mechanical controls—slowly replaced ornamentation in the home.[39] For Banham, this separation of culture and climate suggested that the ideal shell for the modern environment was an architecture hardly distinguishable from its technology.[40] Such architecture did not claim any style or referent but emerged solely from its interior logic: a system of use, comfort, and bodily needs that could claim impartiality on the basis of physiological measurements. Combining climatic considerations and the acculturation of comfort, postwar climatic architects blended Banham's scientized environmental attitude with an idealizing and humanizing modernist pole of architecture.[41] As Lisa Heschong, one proponent of this climate-humanist movement in architecture,

later argued, "heat was a great equalizer—something everyone had to endure, rich or poor, lowly or royal."[42] Combining a variety of "primitive" and "modern" architectural examples, from Buddhist stone temples and Igloos to insulating louver systems and air-conditioned offices, Heschong argued that architecture's role was less to hierarchize society than to codify "sensuality, cultural roles, and symbolism."[43] That this statement seems to be historically and contemporarily erroneous did not in any way impede climatic designers from positioning their work as supporting a classless and raceless society. While maintaining these claims to scientific accuracy, climate-humanist projects considered not only the bare subsistence of bodies but a specific "environment" of "color, temperature, texture ..." that governed behaviors and stresses.[44] Recycling the discourse and methods of bodily comfort instigated by the researchers at the AAL, climatic architecture in Alaska shifted the sphere of cultural study from the Native's skin to one of architectural conditioning and concealment.

Diverging from previous universal camp modules, architects and their clients presented permanent housing projects for oil workers built after initial explorations as unique architectures designed for their specific purpose, climate, and location. They required toolsets of climatic and constructive expertise claimed by a network of recent postwar graduates of MIT, whose faculty, such as Alvar Aalto and Buckminster Fuller, advocated for a technical approach to design and a "humanist modernism" in architecture.[45] By focusing on bodily responses, architectural considerations

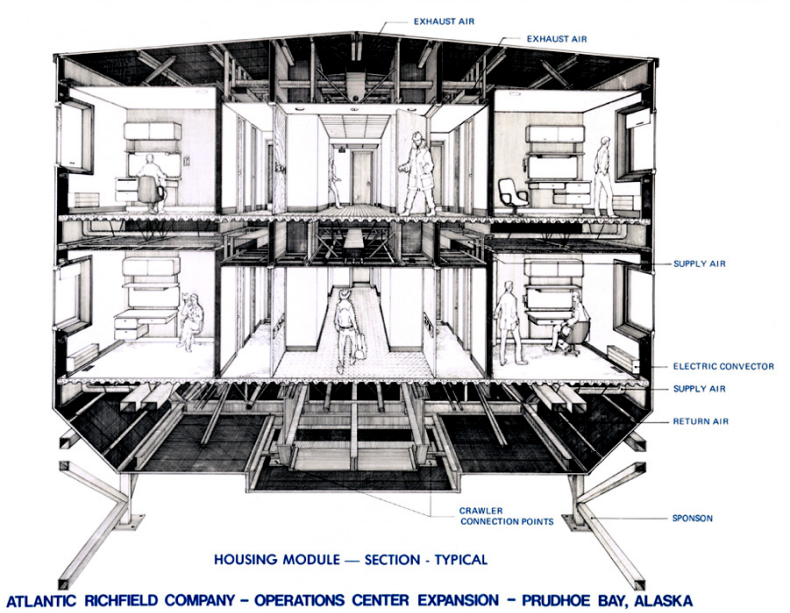

Figure 3
Edwin B. Crittenden et al., *ARCO Operations Center Expansion, Prudhoe Bay* [*Drawings*] (Fairbanks, AK: Second International Symposium on Cold Region Engineering, 1976), 16.

of functionalism were recast to follow a "human point of view to achieve effectiveness."[46]

Assembled from prefabricated modules, the permanent housing project designed for British Petroleum by architecture offices Wallace, Floyd, Ellenzweig, built 1973–74, and for Atlantic Richfield Company by Crittenden-Cassetta-Cannon / Hellmuth, Obata + Kassabaum, completed in 1975, provided shelter for the companies' managerial staff, engineers, and crews working on the oil field in northern Alaska. Positioned seven feet above maintained gravel surfaces, their modules were designed to be both visually and thermally detached from their surroundings.[47]

Contrasting the thermal and structural enclosure with a visual "feeling of openness," the British Petroleum complex incorporated a double-story communal space with glass walls and space frame roofs set between the two rows of bedrooms suites. Using grow lights to sustain a northern-yet-imported indoor garden comprising large boreal trees and smaller exotic vegetation, the courtyard included a recreational area covered in artificial grass that could be programmed into configurations for various activities such as a volleyball field, a sitting area, or an access level. Below the deck, the complex provided a swimming pool doubling as a water reservoir in case of fire, a sauna, a vegetated dining court filled with picture frames, national and corporate flags, a shimmering disco ball, and "the most northern piano in the world" to combat boredom.[48] Atlantic Richfield's simpler structure came equipped with a large auditorium for lectures and screenings, a plush billiard room, an indoor gymnasium, a running track, a gym room, and multiple lounges that employed architectural "variations in textures, colors, and volume [to] provide sensory relief."[49] While bedrooms were seen as spaces for private repose, they were simultaneously conditioned to be replaceable, sterile environments that compelled their occupants to only stay temporarily.[50]

Focusing on technical descriptions of their shells, support piles, and interior "environments," both complexes were presented as climatic engineering feats that could encapsulate transient workers within them.[51] In addition to functional programming, communal and private floor plans were arranged based on the climatic conditions of temperature and room humidity defined for each room. At British Petroleum's center, each bedroom was equipped with controllable room heating, and shared rooms followed a temperature range set between 60 and 80 degrees Fahrenheit adapted to their program.[52] The drawings of Atlantic Richfield's complex underline the highly technical image of the buildings (Fig. 3). Livened with transient workers moving in and out, the section of the housing modules reveals hollow floor slabs, walls, and roof neatly organized by air vents, pipes, structural beams, and heating systems. This juxtaposition of bodies and architectural elements not only hints at the shift in scale in which culture could be understood but also reconstructs the social development effort these were part of.

The Primitiveness of Architecture

Covered in an array of national and international architectural publications, including *Progressive Architecture*, *Baumeister*, *Architectural Forum*, and *Design*, the permanent housing projects for temporary workers appeared as an "architect's architecture" whose social project of conditioning workers was inscribed into a design brief of thermal support.[53] Whereas the authorship of previous construction camps had been concealed within bureaucratic mechanisms of oversight, the permanent shelters embraced architectural authorship as a way to legitimize their project. In popular media, the permanent centers were repeatedly referred to as "Prudhoe Hilton," or an "ice palace" that even "the Queen herself would be pleased to visit."[54] Beyond an effort to attract workers to remote places, planners employed engineered comforts to regulate proletarian culture through hotel-like architecture and condition gender within highly sexualized spaces.

While many workers disobeyed camp rules that prohibited drug use, gambling, and sleeping on the job, planners presented construction sites and housing camps to the outside as transient structures that were morally and physically detached from the effects of Arctic development. Although overseers tolerated clandestine sex work that could stay unnoticed within camps, they visually enforced the presence of "well-behaved" women who would "civilize" the male-dominated crews.[55] Taking distance from "rowdy" male workers and "dirty" sex workers, oil companies staged women working in "hard hats on Alaska's North Slope," in "labs in their white coats," and "of course, … behind typewriters in offices" in corporate magazine and pamphlets.[56] Detached from the urban image of illicit sex work, female employment was endowed with sexual qualities that referred back to the engineered architecture that concealed this work. The contrast these scenes supplied piqued the interest of adult entertainment and women's magazines alike.

During his coverage of female employment during the Trans-Alaska Pipeline construction, *Cosmopolitan* reporter Steve Kline visited the British Petroleum complex where he observed a "strictly Southern California" scene of seductive pool play. Presenting an eroticized description of a woman pulling herself out of the pool that doubles as an emergency reservoir, Kline proclaimed that the facilities "kindle, not douse, flames of a more *primitive* sort."[57] Despite embracing cliché imagery of sexualized encounters, Kline correctly locates the effect of geographic displacement from the Arctic to the contiguous US—an indeterminacy produced by the architectural environment. Although not absent in permanent housing projects, the "primitiveness" of sexual interaction, drug use, and inefficient behaviors quietly took place within the climatized, plush bedrooms and recreational areas (Fig. 4).

A long-form piece published by polemicist Harry Crews in *Playboy* further highlighted the role of architecture in negotiating the gendered culture in camps. Drawn by Chet Jezierski, the article's full-spread illustration depicts a line of men waiting to enter a single trailer supported only by cement bricks and a steel pole and attached to two external gas cylinders. The level skyline passes below the trailer, emphasizing the house's disconnection from the ground on which it rests. The reader of the magazine is allowed a peek through the shades of the trailer and onto the sight of a sex worker seductively dangling her nightwear from her foot. Beyond piquing the interest of its primarily male audience, the illustration presents worker housing not only as a locus of change but also as a force in its own right, one whose partially visible interior life and climatic concealment allowed planners to delimit tolerable worker culture from an illicit and grotesque one. Further, the partially visible female body mimicked the magazine's eroticization of everyday encounters such as peeking through the window of the "girl next door."[58] Paralleling *Playboy*'s role in shifting sex work from an urban issue into a domestic, suburban fetish, the architecture of northern comforts imported a southern view of domesticity and masculinity into a context viewed to be corrupted by sex work, drug use, and inefficiency. This perception of cultural regression was directly linked to the thermal conditions produced by this architecture.

Figure 4
Paul Steucke, "BP Hilton Prudhoe Bay: Guys Playing Basketball," 1975–1977(?) Photographic print. B1994.008.525, Paul Steucke Collection, Anchorage Museum.

Figure 5
Marcus Halevi, "Arctic worker in ATCO trailer, Alaska, 1975–1977," in Kenneth Andrasko, *Alaska Crude* (Canada: Little, Brown & Company Limited, 1977), 39.

Implementing a humanist approach to heat and comfort, architects designing shelter along the Trans-Alaskan Pipeline adapted the climatic and social terms outlined by the Arctic Aeromedical Laboratory experiments to "rethink architectural problems without the usual baggage."[59] Instead of designing for an idealized and normative body—whether of a Corbusian white male, a US Air Force recruit, a productive Native worker, or a "well-behaved" female employee—architecture offices actively designed thermal and cultural environments that negotiated a broader definition of Arctic workers. By expanding the studies of climatic survival that provided minimal comforts to expendable military subjects, these climatic architectures sought to both appeal to and acculturate a novel constituency of foreign petroleum workers through suburbanized, sexualized, and climatized comforts (Fig. 5).

Instead of following Reyner Banham's dichotomy between culture and climate, the permanent housing projects displaced culture as the origin of form, not as a replacement but rather as a Trojan horse through which cultural and economic assimilation could be achieved. Presented as "cold calculations" that were part of an engineered decision process, design acted not just through methods of aesthetic excess but as tactical processes of providing specific comfort.[60] Bridging the scales of bodies and settlements, climatic architectures regrouped the concealment of

behaviors, identities, and the impacts of development to assimilate the Arctic and its workers into the contiguous US and its economic ideology. In the postwar development of the American Arctic, climatic comfort, as measured through heat, sweat, and erotic dousing, replaced an idealized environment as a central concept through which bodies, cities, and national economies could be conditioned.[61] The environment, as the "primitive" origin of American culture, was no longer a romantic ideal but a means of production: a power to be conquered, rendered efficient, and planned with labor and sweat. 🔥

Notes

1 Joseph Russell Smith, *North America: Its People and the Resources, Development, and Prospects of the Continent as an Agricultural, Industrial, and Commercial Area* (New York: Harcourt, Brace and Company, 1925), 3. In his introductory chapter, geographer Joseph Smith recalls that early missionaries returning from Arctic explorations were irritated by the Native northerners' interest in the Christian idea of Hell: a place of constant heat—and thus of southern comfort—only reached by disobeying and breaking cultural rules. It is unclear whether this preference was accurate or simply made up by missionaries frustrated by the fact that their proselytizing landed on deaf ears.

2 This article draws from the second chapter of my thesis, "On Viscous Grounds: Planning for Friction across the Trans-Alaska Pipeline, 1968–1981," (Cambridge, MA, Massachusetts Institute of Technology, 2022). Above all, I would like to thank my advisor Dr. Arindam Dutta, and reader, Dr. Timothy Hyde, for their insight throughout this endeavor.

3 After the federal decree of the Alaska Native Claims Settlement Act in 1972—whose history is entangled with that of the Trans-Alaska Pipeline—the North Slope region was consolidated into the northernmost administrative borough in Alaska.

4 BP Alaska Inc. and SOHIO, *North Slope Alaska: Man and the Wilderness*, n.d., 14.

5 See Edward F. Crippen, "Industrial Health Problems in a Frigid Environment," *Journal of Occupational Medicine* 13, no. 10 (1971): 492–95.

6 Robert Zelnick, "The Oil Rush of '70," *The New York Times*, March 1, 1970, sec. 6, Magazine.

7 Apart from when quoting historical sources, I explicitly use the term Native northerners instead of synonymic groupings to refer to the Native population of current-day Alaska. Through the term, I refer to a large and heterogeneous constituency that has changed drastically throughout ancient and modern history. This constituency includes groups that call themselves Dene, Gwich'in, Hare, Inuinnat, Inuit, Iñupiat, Inuvialuit, Kangiryuarmiut, or Uummarmiut. Many further unnamed constituencies should not be forgotten. The foremost external relationship that is applied to "Natives" is their relationship to modern nation-states, their scientific and governmental institutions, and the way their identities are traced through them. The term "Native northerners" is explicitly detached from this relationship of state subjectivity and relates instead to a geographic extent.

8 Michael A. Osborne, "Acclimatizing the World: A History of the Paradigmatic Colonial Science," *Osiris* 15 (2000): 135–51. In addition to human necessities, acclimatization studies focused on the maintenance of imported animals and crops in colonial geographies.

9 Vanessa Heggie, *Higher and Colder: A History of Extreme Physiology and Exploration* (Chicago: University of Chicago Press, 2019), 1–18.

10 See C. J. Eagan, "Biometeorological Aspects in the Ecology of Man at High Latitudes," *International Journal of Biometeorology* 10, no. 3 (December 1966): 299. Eagan, a researcher at the Arctic Aeromedical Laboratory, mentions the work undertaken prior to World War II by American anthropologist Edward Moffat Weyer and Danish anthropologist Kaj Birket-Smith as precedents to the laboratory's studies. Weyer and Birket-Smith have been attributed with pioneering the study of cultural adaptation to climates in the North.

11 It is only during his post as a researcher at the Arctic Aeromedical Laboratory that physician Kåre Rodahl, along with his wife Joan Rodahl, have been credited with defining the Native as a biomedical "specimen." See Heggie, *Higher and Colder*, 12–13.

12 H. F. Drury, "Arctic Aeromedical Laboratory, United States Air Force," *BioScience* 14, no. 5 (1964): 49–51.

13 Ibid., 49.

14 As quoted in Kåre Rodahl and Donald W. Rennie, "Comparative Sweat Rates of Eskimos and Caucasians Under Controlled Conditions," Technical Report (Fort Wainwright, AK: Arctic Aeromedical Laboratory, March 1, 1957). For a description of animal experiments, see C. J. Eagan, "The Origins of Heat Lost from Extremities in Ice Water," *Technical Note; TN. Arctic Aeromedical Laboratory (US)* 60–13 (April 1961): 1–12; See also C. J. Eagan, J. Durrer, and W. Millard, "Rectal Temperature of the Working Sled Dog," *Technical Documentary Report (Arctic Aeromedical Laboratory (US))* 63, no. 40 (1963).

15 Rodahl and Rennie, "Comparative Sweat Rates."

16 Ibid.

17 Frederick A. Milan, "Racial Variations in Human Response to Low Temperature," in *Comparative Physiology of Temperature Regulation*, ed. John P. Hannon and Eleanor Viereck (Symposia on Arctic Biology and Medicine, held July 17, 18, 19, 1961, Arctic Aeromedical Laboratory, Fort Wainwright, AK, 1962), 335–75.

18 Rodahl and Rennie, "Comparative Sweat Rates," 18.

19 Laurence Irving, "The Heterothermous Condition of the Tissues of Warm-Blooded Animals," in *Comparative Physiology of Temperature Regulation*, ed. John P. Hannon and Eleanor Viereck (Symposia on Arctic Biology and Medicine, held July 17, 18, 19, 1961, Arctic Aeromedical Laboratory, Fort Wainwright, AK, 1962), 143.

20 Kjell Johansen, "The Evolution of Mammalian Temperature Regulation," in *Comparative Physiology of Temperature Regulation*, ed. John P. Hannon and Eleanor Viereck (Symposia on Arctic Biology and Medicine, held July 17, 18, 19, 1961, Arctic Aeromedical Laboratory, Fort Wainwright, AK, 1962), 123.

21 Irving, "The Heterothermous Condition of the Tissues of Warm-Blooded Animals," 149.

22 See Matthew Farish, "The Lab and the Land: Overcoming the Arctic in Cold War Alaska," *Isis* 104, no. 1 (March 2013).

23 Emphasis added by author. Eagan, "Biometeorological Aspects in the Ecology of Man at High Latitudes," 299.

24 Beyond idealizing and romanticizing Native bodies, the research supported by military research labs in the Arctic provided a view of human bodies akin to that of "a white, masculine soldier, posted to or traveling through the region." Quoted in Matthew Farish, "Making 'Man in the Arctic': Academic and Military Entanglements, 1944–49," in *Cold Science: Environmental Knowledge in the North American Arctic during the Cold War*, ed. Stephen Bocking and Daniel Heidt (New York: Routledge, 2019), 86. The masculine bias of acclimatization studies, especially by the AAL, is highlighted in Heggie, *Higher and Colder*, 1–18.

25 Johansen, "The Evolution of Mammalian Temperature Regulation," 123.

26 See Jim Lotz, "Social Science Research and Northern Development," *ARCTIC* 21, no. 4 (January 1, 1968): 291–94; See also George W. Rogers, "Goodbye, Great White Father-Figure," *Anthropologica* 13, no. 1/2 (1971): 279; Andrew Stuhl provides an apt

framing of postcolonial expertise in the Arctic. See Andrew Stuhl, "Disturbed: The Impacts of a Postcolonial Moment," in *Unfreezing the Arctic: Science, Colonialism, and the Transformation of Inuit Lands* (Chicago: University of Chicago Press, 2016), 111–44.

27 National Research Council, *The Arctic Aeromedical Laboratory's Thyroid Function Study: A Radiological Risk and Ethical Analysis* (Washington, DC: The National Academy Press, 1996).

28 AAL staff participated in and organized major national and international conferences, such as the Alaska Science Conference at the University of Alaska and the British Geography Society. See Kathy Price, *Northern Defenders: Cold War Context of Ladd Air Force Base, Fairbanks, Alaska, 1947–1961*, ed. Glenda R. Lesondak, CEMML TPS 01–2 (Center for Ecological Management of Military Lands, Colorado State University, 2001). See also the description of Norwegian physician Kåre Rodahl in Farish, "The Lab and the Land," 15–21.

29 As quoted in Farish, "The Lab and the Land," 2.

30 See Matthew Farish and P. Whitney Lackenbauer, "High Modernism in the Arctic: Planning Frobisher Bay and Inuvik," *Journal of Historical Geography* 35, no. 3 (2009): 517–44. For a congressional example of the health discourse surrounding worker camps, see Alaska Department of Health and Welfare, Division of Public Health, Branch of Environmental Health, "Cold Region Environmental Health Practices [Exhibit No. 12]," in *Trans Alaska Pipeline Hearings: Proceedings, Exhibits, and Supplemental Testimony*, United States Department of the Interior, 1971.

31 The Alberta Trailer Company (ATCO) was the primary supplier of trailer housing to Alaska during the Trans-Alaska Pipeline construction years. See Dan Powers, "$4,000 Operation of 1946 Now Is Largest in World," *The Expositor* (Brantford, ON, Canada), August 3, 1965.

32 James P. Roscow, "The Trans-Alaska Pipeline Is Changing Alaska Economically, Sociologically and Environmentally," *Alyeska Reports* (Anchorage, AK: Alyeska Pipeline Service Company, April 1975).

33 Emphasis added. Crippen, "Industrial Health Problems in a Frigid Environment," 493.

34 Ibid., 494.

35 Edwin B. Crittenden, "Facilities For Human Needs" (21st Alaska Science Conference, University of Alaska, 1970).

36 Ibid.

37 This position was most prominently taken by Le Corbusier. See Reyner Banham, *The Architecture of the Well-Tempered Environment* (Chicago : University of Chicago Press, 1973), 147.

38 For a description of the early environmental movement in architecture, see Avigail Sachs, *Environmental Design: Architecture, Politics, and Science in Postwar America*, (Charlottesville: University of Virginia Press, 2018).

39 Banham, *Well-Tempered Environment*.

40 Ibid.; See also Reyner Banham, "A Home Is Not a House," *Art in America* 2 (1965): 70–79.

41 See Joan Ockman, "New Empiricism and the New Humanism," *Design Book Review* 41/42 (2000): 18–21.

42 Lisa Heschong, *Thermal Delight in Architecture* (Cambridge, MA: MIT Press, 1979), 58. Crittenden's work anticipates the late 1970s humanist view of comfort that became a hallmark approach at MIT's Department of Architecture, particularly through the professorship of Edward Allen. Lisa Heschong graduated from MIT in 1978, advised by Allen.

43 Ibid., 17.

44 "Boredom: It Doesn't Live Here Anymore," *Anchorage Times*, April 24, 1976, Folder 1/27, Edwin B. Crittenden papers, Archives and Special Collections, Consortium Library, University of Alaska Anchorage. This excerpt is paralleled in Banham's writing. See Banham, *Well-Tempered Environment*, 18.

45 Chapter two of my graduate thesis explores the network formed by these individuals in broader detail. See also Arindam Dutta, ed., *A Second Modernism: MIT, Architecture, and the "Techno-Social" Moment* (Cambridge, MA: MIT Press, 2013).

46 Alvar Aalto, "The Humanizing of Architecture," *MIT Technology Review*, November 1940.

47 In an interview with the national architecture magazine *Progressive Architecture*, principal architect on the British Petroleum Operations Center, Peter Floyd, explained that the design should mimic the "feeling of a ship floating on a tundra sea." Quoted in John Morris Dixon, ed., *Progressive Architecture, September 1975*, vol. 75:9, (New York: Reinhold Publishing Company Inc., 1975), 46.

48 "Sub-Zero Hilton," *Design* (October 1976).

49 Edwin B. Crittenden, "The Prudhoe Bay Enclave," n.d., Folder 1/4, Edwin B. Crittenden papers, Archives and Special Collections, Consortium Library, University of Alaska Anchorage.

50 Ibid.

51 Although employing an engineered appearance, the projects' exterior and interior surface elements, wall insulation, and window and door elements were constructed from generic materials instead of specially engineered components. See "BP-Station, Prudhoe Bay, USA," *Baumeister*, August 1975, AB.B325, Avery Index to Architectural Periodicals.

52 Ibid.

53 "Boredom: It Doesn't Live Here Anymore."

54 Helen L. Atkinson, "BP Completes $21 Million Ice Palace," *Oilweek*, July 22, 1974.

55 Dermot Cole, *Amazing Pipeline Stories: How Building the Trans-Alaska Pipeline Transformed Life in America's Last Frontier* (Fairbanks, AK: Epicenter Press, 1997), 55.

56 Atlantic Richfield Company, *Getting the Job Done: Women at ARCO* (Los Angeles: Public Affairs Division, Atlantic Richfield Co., n.d.); Betzi Woodman, "Women Find Challenges on Pipeline," *Alyeska Reports - April 1976* (Alyeska Pipeline Service Company, April 1976).

57 Emphasis added. Steve Kline, "Daring Girls on the Alaska Pipeline," *Cosmopolitan* 180, no. 6 (June 1976).

58 See Paul B. Preciado, *Pornotopia: An Essay on Playboy's Architecture and Biopolitics* (New York: Zone Books, 2014), 51–66.

59 Thomas Fisher, "Cold Calculations," *Progressive Architecture*, November 1982, 135.

60 Ibid.

61 On the notion of the "primitiveness" of the environment and its effect on American economic ideology, see Leo Marx, *The Machine in the Garden: Technology and the Pastoral Ideal in America* (Oxford: Oxford Univ. Press, 2000), 7–11.