Aleutian Ecosystem

AAAS Symposium

26–27 December 1970

Chicago

The Aleutian ecosystem is naturally defined by its original inhabitants, the Aleuts, who developed a distinctive race, language, and culture. They maintained continuous occupation for more than 8400 years, achieving a remarkably sensitive and durable adaptation to this highly productive marine environment. When discovered in 1741 by Vitus Bering, the Aleuts numbered 16,000 and extended from Port Moller on the Alaska Peninsula and the Shumagin Islands in the east, over a linear chain of 70 islands to Attu Island in the west, a distance of 1200 miles. The linear, longitudinal shape of the Aleutian ecosystem, and its geological history, are key elements in the mechanics of energy flow within it.

The coasts and surrounding waters are highly productive because the nutrient-rich Pacific Ocean water moves into the Bering Sea through the Aleutian passes; major upwelling systems promote vertical mixing and the waters are free from ice. The rich supporting fauna provides the basis for complex food chains, attractive to both resident and transient sea mammals, fish, and birds, and thus the nutrient base of the human population.

It is the diversity, abundance, and easy accessibility of foods which contributed to the large and stable native population. The population system was necessarily dispersed throughout the islands, but partitioned into dialectically distinct breeding populations. Because of the great distances involved, random breeding could not be maintained; therefore local differences in trait frequencies developed. Some of these appear to follow a gradient or cline with higher frequencies (seen in dental and serological traits) in either the eastern or western Aleutians. The western Aleuts are smaller and more narrow in their transverse dimensions, possibly reflecting the earlier Aleuts who had narrower skulls.

In addition to the human skeletal and food refuse remains, the rich stone, bone, and ivory items of material culture preserved in old Aleut village middens on all the islands provide a valuable and quantifiable record of household artifacts, hunting gear, and religious figures. The sophisticated practice of mummification preserves a museum record of the people with the more perishable things they valued and used. Carbon deposits in the lungs of mummies indicate that the oil lamps used for light and heat contaminated the household environment.

The earliest known record of Aleuts appears at Anangula Island, 5 miles offshore from the present village of Nikolski on Umnak Island. Here, in the largest, most productive, and oldest site on the Bering Sea coast, over 20,000 specimens were excavated in the 1970 season. These specimens include stone cores and the blades struck from them, stone dishes, lamps, rubbing stones, ochre grinders, fishline weights, a carved stone face, and food refuse in the form of burned bird and whale bones.

The settlement pattern reveals numerous closely spaced house depressions, with more tools found outside and between the houses than inside them. Radiocarbon dates indicate an age of 8400 years, with the possibility of an earlier date from a newly discovered lower level of occupation.

The chipped stone tools are unifacial; they are chipped on the edges of only one surface. This unifacial characteristic, the unusual size range continuous from very small (10 mm) to very large (180 mm) tools, the dishes, lamps, numerous houses, and the food refuse remains set Anangula apart from all other sites in the Arctic and subarctic. These factors indicate a unique beginning for the Aleut population. That the population at Anangula more than 8000 years ago was already large and permanently resident is revealed by the settlement pattern and the abundant associated technology.

At the time the Aleuts lived there, Anangula Island was a part of Umnak Island, forming the far side of Nikolski Bay. Slightly earlier this area was the terminus of the Bering land bridge connecting Siberia with Alaska. Current geological studies suggest that the people may have been completely isolated for a time, or limited to a narrow ice-free access corridor on the Bering Sea side. An ice sheet formed on the Pacific south coast of the land bridge and extended across the peninsula, possibly coalescing with the glaciers of nearby Mount Vesevidoff. The presence of numerous widespread volcanic ash deposits on both Anangula and Umnak islands facilitates the elucidation of the postglacial events.

The more recent village midden of Chaluka, at Nikolski, on which Aleuts still live, contains a 4000-year record of the people, the foods they ate, and the items they made. The oldest occupation begins with stone-walled houses, a low frequency of bifacially chipped knives and scrapers, and a high frequency (which declines over time) of unifacially chipped stone tools. A number of characteristic artifacts (lamps, dishes, ochre pounders) are shared with Anangula.

Another significant discovery of the 1970 season was a burial pit in Chaluka containing the bodies of 12 Russians and one Aleut, probably massacred in the Aleut uprising of 1752. They were all adult males between 22 and 50 years of age, unusually robust, with exceptionally large noses, good teeth, an absence of arthritis, and there was one case of syphilis. They provide an insight into the actual appearance of the first hybridizing population, of the nature of early social relations, and they confirm the accuracy of the old Aleut story describing this event in detail.

Demographic and genealogical studies, the prelude to the biomedical studies, reveal a high degree of relationship between people within a village but no actual inbreeding. One or two mating pairs per generation gain ascendancy through a large number of surviving offspring and create much re-

(Left) Mount Vesevidoff in the background and Anangula excavation in the foreground. (Right) Old Aleut lady preparing a sea lion stomach for storing salmon. [W. S. Laughlin, University of Connecticut]

dundancy in the gene pool. Adoptions are common and constitute one of the ways in which the economic burden of high fertility is dissipated. Out-migration, especially among young girls, has become increasingly common and a shortage of suitable mates presents a demographic problem to the maintenance of the Aleutian village communities.

The Aleuts have successfully adapted to a changing coastline, volcanic eruptions that caused them to move, nuclear tests, foreign domination, depletion of their natural resources, introduction to diseases, and new technologies. They may be expected to adapt successfully to the variety of current threats to the integrity of their biological and cultural tradition.

Owing to a combination of factors—the stability and productivity of the ecosystem, the originally large and distinctive human population, the linear configuration which has limited gene flow to the most simplified model possible, and to the long and statistically reliable archeological and historical record—a multidisciplinary research program was developed under the title "Aleut Adaptation to the Bering Land Bridge Coastal Configuration." It is a part of the International Biological Program and is supported by a grant from the National Science Foundation, the Wenner-Gren Foundation for Anthropological Research, the University of Connecticut, and other sources. The first focus has been on one exploitational area, the southern end of Umnak Island where the Aleuts first appear on the scene.

Studies on the reef and in the deeper sea communities, as well as of the bird and lemming populations, will be initiated. Preliminary studies of plant biomass and the construction of models for systems analysis of energy flow have been started.

W. S. LAUGHLIN
University of Connecticut, Storrs

Speakers and Topics

(26 December, afternoon)

Divergence and Distinctiveness

Introductory Remarks: W. S. Laughlin, *Delimitation and Components of the Aleutian Ecosystem.*

Geology: R. F. Black, *Glacial Geology of Umnak-Anangula*; T. Meyers, *Ash Stratigraphy of Warm Cove, Umnak.*

Animal Populations: A. Harper, *Aleut Physical Anthropology.*

(26 December, evening)

Ecological Studies

Major Aleutian Fauna: K. Kenyon, *Sea Otter Behavior*; R. Jones, *Aleutian Bird Communities*; L. K. Lippold, *Archeologic Faunal Remains (Mammals)*; G. B. Dennis-ton, *Archeologic Faunal Remains (Birds).*

Aleut Race, Language, and Culture: J. S. Aigner, *Configuration and Continuities of Early Aleut Culture (8500 BP)*; Father Innocent, *History and Structure of the Aleut Language*; M. Zimmerman, *Aleut Mummy Pathologies*; R. Sternbach, *Demography of Aleut Communities*; D. Jones, *Present-day Aleut Communities*; A. Harper, *Aleut Massacre of Russians.*

(27 December, morning)

Ecosystem Analysis

J. M. Hett, *Systems Analysis*; W. S. Laughlin, *The Aleutian Information Matrix.*

A showing of Aleutian excerpt from the NBC film, *The First Americans*, with commentary by Craig Fisher.

Preliminary Program Notes about the 1970 AAAS Annual Meeting appear in the 28 August issue of Science. *Reports on symposia appear in the following issues: 28 August, "Human Behavior and Its Control"; 4 September, "Land-Use Problems in Illinois."*