



Creating the Nation's first BioPark

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Letter From the Desk of David Challinor
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During the first half of January 1997, I took a cruise aboard the Odysseus around the southern tip of south America; it was an enthralling trip. I was on board as Smithsonian lecturer on the natural history of the region. Historically, one of the most fascinating components of this isolated region was the Amerindians, who successfully adapted to this inhospitable climate over a period of seven or eight thousand years. They will be the subject of this letter in which I will try to explain how they survived and, more poignantly, how they disappeared.

Originally four tribal groups, each speaking a different language, lived on the southern tip of South America. Three tribes occupied the coast line and were primarily fishers and sealers. The fourth, known as the Ona, were hunters and forest dwellers in the mountains of Tierra del Fuego that lie north of the Beagle Channel (see map). The men averaged almost a foot taller (being up to 6') than the coastal Indians. Their primary staple was the wild guanaco, one of the South American camels that still range almost the whole length of the Andes and the animals from which, we believe, the llama and alpaca were domesticated millennia ago.

The island of Tierra del Fuego, scientists surmise, separated from mainland South America only about 8,000 years ago. Archeological evidence indicates that the first inhabitants, forebears of the Ona, walked there sometime earlier when the island was still joined to the mainland, perhaps as far back as 12,000 years. The coastal tribes arrived about 6,000 years later and were generally confined to the shore along which they camped, fished and hunted sea lions which were large and plentiful; the southern sea lion is almost double the size of the better known California one seen regularly in zoos. Seal hunters used 3m long spears from which the head detached after hitting the animal. A long line fastened to the spear head was tied to the middle of a meter-long pole, which slowed the swimming sea lion enough for it to be overtaken by the hunter's canoe. Sea lion meat was the source of 87% of their protein, but there was a cost to this rich diet. Fatty meat and blubber are hard for humans to metabolize without extra oxygen as an energy source. The coastal tribes thus developed disproportionately large chest cavities similar to the Indians who lived in the oxygen deficient altiplano of Peru and Bolivia. Large lungs can absorb more oxygen with each breath than small lungs and thus more oxygen entered their system than would be needed for metabolizing other diets.



Both Magellan (1519) and Drake (1578-80), when skirting the tip of South America, commented on the Indians they encountered and described the numerous fires they saw along the shore. The Europeans were struck by the ability of these people to live in such a cold, rainy, windy place without clothes. When we were there in mid-summer, sunny mid-day temperatures were in the low 50's F. Men and women wore only a guanaco skin with the fur side out, evidently to reduce the risk of vermin on their bodies. When hunting or otherwise using their hands, the men merely dropped their skin robe on the ground, thus insuring agility and free hands. As a result of research by the Centro Austral de Investigaciones Cientifica (CADIC) in Ushuaia, scientists believe that the key to the Indian's survival without clothing was their use of fire, for which wood is a convenient fuel.

Pollen analysis indicates that trees only started growing along the coast of Tierra del Fuego about 6,500 years ago. Prior to that time the steep shores were lined with grasses. Once the trees spread shoreward from the interior mountains, perhaps because of climate change, wood became a ready fuel source. In a wet, windy climate the human body dries before its clothing, especially when animal skins are worn. With adequate and accessible fuel, it was easier for Indians to stay warm and dry with fire than with clothes. They became expert at keeping fires burning and even developed a technique to move a camp fire in the bottom of a canoe by having it burn on a wet sand base. It is considerably easier to keep a fire going under these conditions than to extinguish it and start a new one. Their ever-burning fires, therefore, were a feature of the landscape seen by early European explorers and is thus the etiology of Tierra del Fuego (Fireland).

Darwin, in the "Voyage of the Beagle," described how he and some sailors built a bonfire on the beach to warm themselves and dry their clothing. A group of Indians had joined them and, although further from the fire than the Englishmen, Darwin noticed that they were streaming with sweat. Clearly their bodies had adapted to being warmed by low heat sources.

Another interesting aspect of the physiology of these Fuegians was the women's ability to swim in water that is generally about 6.5°C or in the low 40's F. Were most of us to attempt this, we would risk hypothermia. Anthropologists working there in the 1880's reported that only women swam. Girls learned as babies and as adults they did most of the fishing and collecting of shellfish, especially mussels. Because accessible beaches were so few, when a shore campsite was established the women paddled the canoes just offshore and moored them by looping kelp fronds over the open top of the canoe. Some of these fronds were as long as 100' and when the canoes were securely moored under the fronds, the women swam ashore.

The division of labor was rather evenly divided. The men made and repaired the canoes, gathered fuel, kept the fires going and hunted. Women "owned" the fish they caught and thus were free to distribute them as they wished. Women also cooked, fetched water and tended the young. As in the case of most Indians and other nomadic people, the Fuegians were able to accumulate body fat during times of plenty; women were better insulated and perhaps it was logical for them to be the swimmers. The fat reserves, in turn, could be drawn on in times of famine, as do many birds and other mammals. Such an adaptation for survival may account for the prevalence of obesity in today's populations that were once subject to regular food stress, but whose members now have become sedentary and adequately fed year round.

Having to move camp at frequent intervals to hunt sea lions, these Indians occasionally practiced Talucana. When a member of the band became too weak to keep up, the others would openly discuss the health of the helpless "patient." If all agreed the condition was hopeless, death was hastened by strangulation.

Although customs varied between the four tribes, none had a marriage ceremony as we know it. A young man usually bargained for a wife with the father of a young girl. If she was still sub-adult, he would often take on an older woman to live with him. This woman would stay on when the young girl finally matured enough to join the "household." Frequently a younger sister would join her married older sister and become wife #2, thereby helping with child-rearing and other chores.

One characteristic common to all Fuegians was their concept of property and expression of gratitude. Their complete disregard of property rights and their utter failure to show any sign of thanks for gifts was a source of continuous frustration to the Europeans who dealt with them. The Indians' perception of life and their attitudes were very different from ours, but emphatically neither better nor worse.

The story of the Fuegians is a sad one. In 1868 the first big sheep farm or estancia was established on the south coast of Tierra del Fuego at Harberton and many of the Indians were hired to build roads and fences. The Ona hunters killed sheep to eat as they were easier to acquire than the wild guanaco. Sheep ranchers reacted strongly by killing Indians. European sealers furthermore virtually wiped out the sea lions on which these people depended for food, harvesting as many as 800,000 sea lions and fur seals in one season in the 1880's. Finally, the missionaries made them wear clothes for which their body metabolism was quite unsuited. By about 1945 alcohol and diseases to which they had no resistance had taken their toll and the Fuegians, who probably had never numbered more than 9-10,000, died out.

The Fuegians are an excellent example of the ability of humans to adapt to almost any climatic condition where food and fresh water are available. Consider the historical Inuit who, like the Fuegians, were predominantly meat eaters. Because their habitat was so dry, compared to that of the Fuegians, they used fur clothing rather than fire to warm themselves. Other examples of extreme human habitats are deserts and tropical rain forests. Humans' extreme adaptability has allowed us to occupy almost every corner of our planet, except for space and deep oceans where duration of tenancy is limited by adequate storage of food, potable water and breathable air. Recent improvements in recycling used gases and in developing ever more concentrated food supplies should allow humans to live for increasingly longer times on ocean floors, in space or even on the moon. In the future, the ability of humans to adapt to their environment will undoubtedly depend more on psychological factors than on physical ones, as in the case of the Fuegians. Nonetheless, these mental challenges are being successfully met in long-term space living by astronauts and cosmonauts.

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