

Prof. Bryan left Waimea to climb **Mauna Kea**, 13,825 feet high, on Thursday, August 17. Then he climbed Hualalai, Mauna Loa and later Kilauea. While on **Mauna Kea** he verified his former discovery of the fact that once upon a time, probably in the later glacial age, the mountain bore an ice cap from which there was glacial action. Speaking of his trip Prof. Bryan said:

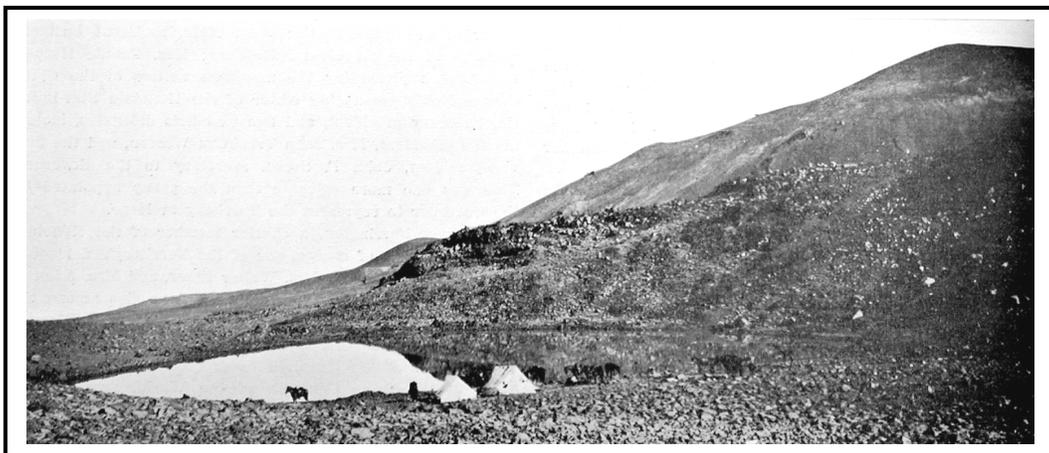
I left Honolulu on Wednesday in the **Mauna Kea** and reached Waimea Thursday morning, where I made arrangements for horses and guides and started up the same morning. We camped Thursday night at the timber line and reached **Waiau** Lake, near the top of **Mauna Kea** just before two o'clock Friday afternoon.

***Night on the Mountain Side.***

It was late when we started back, but we hope to make our old camping grounds. However, we were caught in a dense fog and rain and had to spend the night on the mountain side and sleep standing up, moving about every little while to keep warm. We could not see to negotiate the dangerous trail. We got back to Waimea on Saturday and I immediately transferred my headquarters to Puu Waawaa...

...The trip was undertaken principally to compare the formations of the four mountains. All are volcanic. But Hualalai is the oldest of the four, while the top of Mauna Loa above the 9,000 feet limit is much more recent than the top of **Mauna Kea**. The upper part of Mauna Loa has been built up since the glacial age of **Mauna Kea**. The trip was in every way a most satisfactory one.

In an article titled "Forestry in the Hawaiian Islands" C.S. Judd, Superintendent of Forestry included a photo of a camp at Waiau (*Figure 20*), in which he reported that it was the goal of the forestry department to plant pine trees in order to provide fuel to travelers (Paradise of the Pacific, December 1921:84)



***Figure 20. In Midsummer Waiau Pond, near the summit of Mauna Kea [White Mountain] at 13,014 Feet, has Some Water, Some Snow and Some Ice. In Winter it is all Snow and Ice. Pine Trees will be Planted Here to Furnish Fuel for Travelers. (Copy Photo, KPA-N810)***

**“A Christmas Holiday Mountain Trip” (1922)**

**L.W. Bryan**

***Paradise of the Pacific, December 1922:73-74***

***(Ascent of Mauna Kea from Umikoa Ranch; Description of Vegetation and Topography):***

Much has been written on the ascent of **Mauna Kea**, from the time of the early explorers, who sometimes took a week to make the trip, up to the present when it can be made in one day.

As we look over the records of explorers and read their accounts, a century or more old, we find that this country has undergone a radical change. Now, instead of the wet and mud of the jungles that they describe, we pass through, first, about three miles of waving sugar cane, followed by almost open ranch land, which was at one time thick jungle, but the cattle have reduced it to a few scattering groves of *Ohia* (*Metrosideros polymorpha*) and *Koa* (*Acacia koa*).

Our actual start, December 29, 1921, is made from the little village of **Kukaiau** on the Hamakua coast. From here we ride *mauka* through the cane lands and part of the ranch to **Umikoa**, headquarters of **Kukaiau** Ranch. **Umikoa** is beautifully located at 3,500 feet, surrounded by tall Blue Gums, and here we spent the night as the guests of Donald Macalister, ranch manager, who is to accompany us on our trip.

At about three in the morning we are awakened and crawl out of our warm blankets into the cold morning air. For it is quite cold at this season, even as low as 3,500 feet. And to those of us who have been living at sea level it is quite noticeable.

We enjoy a hearty breakfast and by four o'clock we are in the saddle and ready for the climb.

The morning is clear and cold, but there is no moon, and we start off, six of us, hardly yet awake. The horses are used to this country and make good time, so that by sun up we have passed **Puu Kihe** and are out of the ranch lands into the **Mauna Kea** forest reserve. The growth here is entirely different. The *Ohia* and *Koa* are left behind and we now find ourselves in the *Mamani* belt (*Sophora chrysophylla*). This reserve of 66,000 acres extends from about 8,000 feet elevation to the top of the mountain.

Our horses have all made this trip several times, as has our cowboy guide, so that there is no time lost in searching for the trail.

At about 10,000 feet the *Mamani* becomes scattering and shortly ends. Here we find very little growth. A few bunches of grass, Silver Sword, a silver leaf geranium, and a few other plants.

The numerous herds of wild cattle so often mentioned by the early explorers have practically disappeared and it is only once in a while that we see any, and then only at some distance.

At about 11,500 feet we find the “terminal moraines,” showing the extent of the great glacier which at one time covered the top of **Mauna Kea**. These piles of “Blue Stone” are very interesting. They seem to prove that the Island of Hawaii is not nearly as young as was formerly supposed.

**Mauna Kea** (White Mountain) is rightly named. We are now in the snow, and the summit, seemingly not far away, is white and glistening in the sun.

The long time since breakfast and the keen mountain air have combined to give us a good appetite, so we find a sheltered spot and have lunch. When we finish there is not enough left for a hungry sparrow.

From here we push on through the snow and about noon we arrive at the top, an elevation of 13,825 feet. The day is still clear and the view is wonderful. On one side is snowcapped Mauna Loa (13,675 feet), and the wind coming across to us from that direction is sharp and cold. Turning a little, we see Hualalai (8,269 feet), and then, a little more to the north, the Kohala Mountains, and just beyond, above the clouds in the channel, we see the top of Haleakala (10,032 feet).

Many cinder cones can be seen, now filled with snow, that at one time were as hot as they are now cold. Hilo is not visible as the clouds have settled on that part of the island. But Hamakua is clear. The trip is more than well worth the view.

After leaving our names in a bottle at the Summit we start the down trip, via the cinder slide on the south side. It is very steep and the horses slide most of the way in the loose cinders and snow.

At 13,025 feet we come to Lake **Waiau**, tucked away between two Puus. This is a large pool of water about eight feet deep, with no outlet, and very greenish in color. The ice has formed and we enjoy a few slides, wishing that we had brought some skates with us. After playing around a while, and taking a few snaps, we again start down. Our sun glasses have protected our eyes against the glare of the sun but our faces have turned a deep red, and a few days later the skin peels.

On the way down we stop to see a few patches of "Silver Sword" (*Argyroxiphium sandwicense*). There are only a few remaining of this strange looking plant on **Mauna Kea**. It is more plentiful on some of the other island mountains.

About dusk we run into the fog, but we are now on the ranch again, and by seven o'clock we are back at **Umikoa** after 15 hours in the saddle. We are all dead tired and hungry, and ready for a dinner cooked by the best cook on the island. A roasted wild mountain turkey is 14 pounds when we start, and about 14 ounces when we finish our meal.

It is a long hard trip, but well worth the effort, and it is something to look back upon in time to come. No mishaps all day; not one of the party was mountain sick, except one of the horses.

A day well spent and one I hope to have the pleasure of repeating.

***"On Arctic Peaks 'Neath Tropic Skies Afoot Over  
Mounts Hualalai, Mauna Kea and Mauna Loa on Hawaii's Largest Isle" (1922)  
by Lawrence Hite Daingerfield<sup>26</sup>***

***Paradise of the Pacific, December 1922:80-90***

[From the summit of Hualālai] ...Far down the slope toward Kaalapuali ranch house, the cones stood forth beneath the mottling clouds, a rare and splendid vista, never to be forgotten. In the distance stretched the far-reaching groves of sandalwood, carpeted with nodding, golden-eyed flowers, far a field from their mainland home.

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<sup>26</sup> Trip made by Lawrence H. Daingerfield, T.R.L. McGuire, Max H. Carson, and William (Willie) "Let's Go" Meinecke.

That afternoon we descended through this realm of sylvan beauty and solitude, to camp at Kaalapuali. Long before the first golden rays of the sun crept over the north flank of Mauna Loa, a bovine chorus, with a mynah bird obligato from a monster eucalyptus, performed the part commonly done by the alarm clock. Many mama cows and a like number of their healthy offspring were the causes of all the “confusion worse confounded.” The outcome of it all was, perhaps, a fortunate early start into the realm of the unknown.

Bidding our solicitous friends *aloha*, with packs aback, we proceeded, Indian style, single file, up the Judd trail, to the land of fascination and adventure. Some five miles toward the rising sun, out on the arid southeast slope of Hualalai, we beheld **Ahua Umi**, standing a half-mile to our right, lonely and forsaken in all its ancient, although somewhat dissipated glory.

### ***Story of the Good King Umi***

Here, it is said, Umi, the good King of Hawaii, about the year 1500, had a great *heiau* or temple built. It was then his pleasure to have called together all his people from Kau, Puna, Hilo, Hamakua, North and South Kohala, and North and South Kona districts, that a census might be taken and a great festival might be held. The people from the various districts piled stones, each one a rock according to his or her strength. Eight great ahus or pyramids were erected thus, each oriented from the central temple or *heiau* [page 82] in the direction of the several districts of the Island of Hawaii. In the midst of his *heiau*, sat the good King Umi and his high chiefs and priests, viewing the taking of the strange, first census of Hawaii.

To this day the place is called “**Ahua Umi**” (rock heaps of Umi or Temple of Umi, as you like), and people speak of the place as the “Plain of Numbering.”

But strange, sad things have happened to this ancient “Plain of Number.” The central *heiau* fell in time, no one seems to know just when or how, to the lowly estate of a goat corral; thus the genus *capra* came with profane bleatings to the place made sacred in the days of old, by Umi and his followers. “How have the mighty fallen!”

But we must hasten, for both time and water are fleeting. To our left rose Hualalai, just conquered; to our right, with deceptive easy curves, Mauna Loa loomed in all its majesty; straight ahead, in the blue and hazy distance, **Mauna Kea** beckoned. All about us was a barren waste of lava gravel.

### ***The Region of the Waterholes***

A little way up the Judd trail, perhaps a quarter of a mile, we branched off to the left and a thousand paces brought us to Waikapae, the region of the luawais or waterholes, deep down in the *pahoehoe*. We had been told of this place and the guiding ahus or tiny rock heaps. A little searching brought us to a deep cleft in the *pahoehoe*, the bottom of which was covered with thin, flat rocks—true evidence of the work of Hawaiian hands. Beneath these slabs we found the cool, sweet water—the only water in a forty-mile strip of lava desert, sparsely clad with trees. Here we ate our lunch by the *luawai* beneath the thin shade of a friendly *lehua*. Absorbing all the water we could, we filled our canteens (two quarts) to the brim, and four tin buckets, holding a quart or more each, used for cooking, were also requisitioned—most fortunately.

Then we returned to the Judd trail, with heavy packs on our backs, canteens about our necks, and each carrying a bucket of water into the region of the unknown and perhaps never before traversed by the feet of men. The Judd trail ended as suddenly as it began—about two miles farther on. We were then in a low forest of *lehua* and decided to go on in the general direction of the trail, toward two reddish hills in the dim distance—**Na Puukulua**—with the **Waimea-Humuula** road at the base of **Mauna Kea** beyond.

Soon we came out on the black, shiny, fresh surface of the 1859 lava flow from Mauna Loa. It was not difficult going here, although the *pahoehoe* (smooth lava) was somewhat shelly and brittle. Two miles of this brought us on to old lava. Then it was that mile after mile we crossed these ancient fields, practically following the 6,000-foot contour. Here were mingled inextricably *aa* and *pahoehoe* in utmost and uncharted confusion. We passed through many oases-like kipukas, with their friendly trees and unfriendly brush—*ohia lehua* and *puukeawe* [*pukiawe*], mostly. We qualified as first class balancers with our burdens—never spilling our precious water.

That night we camped in a little sink in the *pahoehoe*, where a tiny bit of soft earth, rootage for the *puukeawe*, was found. Goats and birds were our only neighbors. Reduced to the water in our canteens, we proceeded on our way with the early dawn, ever 20 degrees north of east by our compass, when landmarks failed.

In mid afternoon, we passed a strange lava platform, some hundred feet in length, six feet through, and five feet in height. It stood on an open plain of smooth lava, three or four miles to the southwest of **Na Puukulua**, ever looming bigger in the foreground. [page 83]

We ate our lunch, with our fast vanishing water, beneath a fine *lehua*, growing apparently from pure ancient lava. What soil it had for rootage was invisible. We were then beside the last of the twin **Na Puukulua**.

#### ***Walking on Jagged Glass-Rock***

By early afternoon, after crossing some extremely rough ancient lava, we came to the edge of the real nightmare of the land of great adventure—the Mauna Loa lava flow of 1843. Before us, in mighty ten-twenty-thirty foot windows extended, it seemed in endless confusion, the gray black horror of loose, clinkery, glass-edged *aa*. To step on a large piece of the stuff was hazardous in the extreme. Light in specific gravity, the wobbly mass slipped and slid, ever threatening to throw us down the glassy slopes into the lava ravines. Here was a place to make shoemakers happy, for the jagged glass-rock virtually cut our shoes to pieces.

It was a wonderful experience, however, navigating over the wobbly, clinkery field of *aa*; but the most delightful part of it was the finale, when we arrived in the midst of a transient shower at a group of red-gray hills, the home of many wild sheep, in the midst of a *kipuka*. The devilish 1843 lava seemed to spread in an endless stream beyond the hills, toward Keamuku, in the direction of the sea. McGuire, happily, climbed up one of the sheep hills, looked out toward **Mauna Kea**, and, blissful joy!—ancient lava lay just around the turn of the hill—the right arm of the 1843 flow had reached here and gone no farther—only the left branch had proceeded on its way to Keamuku.

Two miles walking through delightful bunch grass over heavenly soft earth now brought us to the **Waimea-Humuula** road. We now had about a quart of water, and eleven more miles to go along the dusty road. But that was nothing. The earth was soft and the approaching night air cool on the shoulder of **Mauna Kea**. Resting and eating a dry supper, we hurried on to **Kalaieha**, the ranch house of the **Humuula** Sheep Ranch.

The wonderful red, crimson, and purple colors of the sunset glow that evening awoke some of the waning enthusiasm for the wonders of nature. There seems to be always a system of balances in this old world—for every great effort we make there seems to come some compensation. In the last light, **Mauna Kea** and Mauna Loa seemed to glow like happy beacons to us, their struggling devotees far below.

### ***Hilo's Lamps, Like Stars Below***

That night, rather late to be sure, Henry Kahalewai, the best cook on the slopes of **Mauna Kea** (it seemed to us) brought forth hot biscuits, hot tea, stewed wild pig, and gallons and gallons of the finest mountain water for our edification and refreshment in the sheltering kitchen of **Kalaieha**, thanks to the wonderful hospitality of the ranch management. That was Saturday night and the next day, being Sunday, and we being tired, we rested at the foot of our [page 85] shrine—**Mauna Kea**. At night we could see the glowing lights of Hilo to the southeast, twinkling like myriad stars, far down on the long slope of **Mauna Kea** and Mauna Loa.

The morning found us trekking upward through great open groves of splendid *mamani* trees, with round, handsome crowns, like huge apple trees, the south slope of **Mauna Kea** ever growing steeper and rougher as we ascended.

Timberline was passed in mid-afternoon at an elevation of over 9,000 feet. Down below us stretched a long series of cones and groves of *lehua* and *mamani* trees. In the distance, like a tiny oasis, the cypress-lined square of **Humuula** sheep station ranch house—**Kalaieha**—smiled up to us from the gray plain. The trade wind, coming in from the Hilo coast, soon brought in the white cumuli, which drifted lazily below us across the plateau between Mauna Loa and **Mauna Kea**. Far to the southwest, the tips of other white clouds nosed over the horizon, forerunners of the Kona clouds, that never quite met the trade wind clouds over the plain below.

### ***Terminal Glacier Moraines***

Climbing over much old *aa* lava, we came out at last on the weathered and eroded side of the old volcanic mountain, with its multitude of cones. Between 10,000 and 11,000 feet, we arrived in a field of thousands of rounded boulders, all size and shapes, arranged in tiers and phalanxes, true terminal glacier moraines. Another thousand feet up, we found great polished table-like rocks, over which the ancient glaciers had ground their way, leaving striations as indelible hieroglyphics—Nature's writing made by passing glaciers.

In this same zone of thin, cool air, we found our first pile of adze chips—thousands of them heaped where the ancient adze makers had worked and made their implements of stone at the mouth of their sleeping cave in some forgotten time.

The next thousand feet or more was tedious going in the extreme, through the sliding, weathered lava and cinders, to the pass to the right of the summit cone, and down the slope of the shoulder of the mountain wherein nestles the surprise of **Mauna Kea**—Lake **Waiau**. Here, as the sun dipped behind the blue waters of the Pacific, curving up to meet it, we gazed with astonished eyes upon a tiny emerald gem, glacier made in some past time, set in a niche in the arid side of **Mauna Kea**.

### ***In an Arctic Zone Under Tropic Skies***

We pitched our tent hurriedly by the green, cold lake, built a fire in the whipping trade wind, with its chilly bite, ate an early supper, and retired like packed sardines between our blankets. We were in an arctic zone under a tropic sky. Taking our last look across the lake, we saw the image of fair Venus, streaming in white and shimmering light across the tiny, rippling waves. A thousand jewels glittered in the reflected phantom light of our neighbor planet.

The next morning, ice over a half-inch thick was found in the gravel bar about the lake. Above us, just a little way, snow banks lay, chilled and white and permanent. Reaching the summit, at 13,825 feet, we found great drifts of frozen whiteness, two hundred yards or more in length and thirty or more in width. Here we indulged in **Mauna Kea** pie, composed of frozen cakes of snow and chocolate bars.

But Mauna Loa, across the vast abyss of lava plateau, beckoned us onward. Hence we rambled down the wild, strange slope of the volcanic pile, stopping that night in the bunk house in the midst of the tall, nodding cypress trees, to continue on the next day, over the **Puu Oo-Volcano trail**, to Keawewai. This is an old cattle trail across many lava flows, including the 1880-81 flow that nearly reached Hilo. Many delightfully cool kipukas rested our weary feet from the hard lava, and when we reached the forests of great [page 86] koas, we knew that rest and water were near. Here it was we rested for the night, refreshed for the great climb of the next day... [page 87]

### **“Hiking Hawaii’s Highest Heights” (1923)**

In the account below, author, Thomas McGuire (Paradise of the Pacific, September 1923), tells of a journey made by himself, Marie C. Neal and a party of five others to the summit of Mauna Kea in 1923. The route to Mauna Kea, was taken from Kuka’iaiu, to ‘Umikoa, and then to the summit past Kaupō on the ‘Umikoa-Mauna Kea Trail. The return trip was taken past Pāpalekōkī, towards Waimea, and out to Pali Ho’oukupapa. They then conducted a hike around Mauna Kea, past Hanaipoe, Keanakolu, Laumai’a, and on to Pu’u ‘Ō’ō, and then traveled across Humu’ula, Kipuka ‘Āina Hou, and out to Keawewai, in Keauhou:

...Sunday, May 13, entrained at Waiakea for **Kukaiaiu**, arriving at noon after a delightful scenic-railway trip. We hiked to the sugar plantation where Mr. J. James kindly furnished us a pack mule to carry our provisions and camping outfit up to **Umikoa**. We trudged through two miles of canefields, mighty warm going, then two miles through the homestead lands where apple trees were beginning to bear, and other fruits; then a mile through the *ohia lehua* forest, helping ourselves from the abundance of thimble-berries; then a half mile of open ranch land—and **Umikoa**, where the Sumners tucked us in for the night.

#### ***Morning in a Wrap of Fog.***

At four next morning the ranch bell tolled in the fog-veiled dawn, the ranch dogs howling an accompaniment. With this melodious awakening were we divorced from our beds. Following a camp breakfast, a pack mule was purchased by each member of the party taking a seventh interest, at \$7.15 per person. Mr. Sumner told us that we were heading for party unknown to him. We traveled through green pasture land, where wild flowers bloomed, and soon we were above the clouds on the 8,000 foot contour. Looking north, we beheld Haleakala, Maui Island’s 10,000-foot extinct crater, standing in beautiful tranquility.

#### ***“If” is the Mule’s Name.***

We named the pack mule “If,” so doubtful was his dependency. At each brief rest he wanted to lie down and roll. We discovered that the animal needed at least a month’s training in mountain climbing. Camp was made at the 10,000 foot elevation.

The second day’s dawn found If as silent and non-committal as a mummy. Replenishing our water supply at the forester’s camp site, we followed a course south-by-east to avoid the jagged *pahoehoe* (one of the various lava formations), climbing perspiringly over loose *aa* and cinders between cinder cones, gradually ascending the massive slope. On reaching the 12,500 foot elevation, If, the pack mule, was again exhausted, and we were forced to camp in *aa* and cinders, with a frigid wind upon us. Coffee was prepared and we ate a dinner of canned salmon, beans, raisins, prunes, and crackers. If got his portion of rolled barley sprinkled with water.

#### ***Mount’s Shadow on the Clouds.***

Huddled in our blankets we sat gazing east, over the clouds 6,000 feet below us and extending to the far horizon. Delineated by the setting sun on this phantom-scene was the shadow of **Mauna Kea**. We shivered to sleep beneath the cold canopy of stars and the

Milky Way. During the night one of the party thought he had been awakened by an earthquake, but the shake was within himself.

Jack Frost was anxious to nip us on the third day, but old Sol's coming frightened him away. Breakfast consisted of hot rolled oats and coffee, by sterno heat. A handful each of raisins, prunes, dried apricots, and peanuts, was pocketed to serve our hunger during the day.

### ***The Snow Bosomed Goddess.***

With a sigh from If, we started entering the portals of ***Poliahu***, the snow-bosomed goddess. Passing between cinder cones, like giant sentinels guarding the arid mesa, we soon came upon Poliahu's throne resplendent. We passed many large bare cinder cones, covered in winter, before reaching the central and highest cones which were entirely shrouded with snow. The snow continuing down the western side of the mountain to the 12,000-foot line.

Highly enthused, we started to climb an arctic cone 'neath a tropic sun. Reaching the frozen apex, 13,825 feet above sea level, we could scarcely stand against a penetratingly cold wind from the northeast. Here Dorothy Phillips found a little *iwi* bird frozen in the snow (which was brought back for the Bishop Museum).

After frolicking in the snow we started on a 300-foot slide down the northwest end, for Lake ***Waiau***, where the guide was vainly trying to coax and pull If, who had fallen three times in the drifts and was beginning to think his transgressions were too heavy to permit him to pass through the realm of ***Poliahu***. Not being Eskimos, we realized we could not camp here without shelter from the wind. Changing our course, we descended westward to the 12,000-foot line, where we found a sheltering rock ledge just before the sun sank beneath the sea of clouds. After a chattering chow, with hot lemonade made from melted snow, we turned in for the night, making the best of the two blankets and wishing they were two dozen, our dauntless guide "hitting the hay" under his lone blanket.

### ***25 Mile Sun-Kist and Hungry***

Our guide was up with the sun on the 17<sup>th</sup>, melting two pails of snow from which he prepared coffee and rolled oats. These we partook of with raisins, wishing there was a cafeteria in the immediate neighborhood. If had eaten his last morsel of rolled barley and was observing us with his democratic air. Hastily packing, we refilled our canteens with snow and descended north-west, out of the snow region, through the sweltering arid section of loose *aa* lava below, that gnawed our shoes distressingly, then into the scrubby *mamani* and *koa* forest at the 8,000-foot elevation, with the cooling fog enveloping us; then down to the Parker ranch land, stretching out its green meadows for miles ahead. The equilibrium of the descent with If helped us to cover 25 miles that day, from the snowy region to the Pali Hooukupapa (lumber-shipping-hill), where we arrived shortly before six o'clock, tired, sun-kist, thirsty and hungry. Here, through the kindness of Alfred Carter, little Ishi had a dinner that we did ample justice to. Steaming rice was set out in a huge, deep pan, with a wooden paddle, and there were repeated calls for "Another paddle of rice please." Later in the evening we indulged in a refreshing cold bath and then crawled into bunk-house beds.

### ***And Now for the Other Mountain!***

On the morning of the 18<sup>th</sup>, after a hearty breakfast, two of our party, Katherine McGregor and E. Herrick Brown, who had planned only for the ***Mauna Kea*** trip, bid the rest of us an *au revoir* and left for Mana to meet an automobile from Hilo. The rest of us started on the long transverse trail, via the 6,000-foot contour of ***Mauna Kea***, to ***Puu Oo***. After tramping two hours over low rises of pasture land, seeing large herds of bellowing cattle, which

seemed delighted to look at us close up, we came to the lonely station of Hanaapoe [**Hanaipoe**] (evenly stacked). Here, in picturesque setting, we saw an apple tree in full bloom. On a log we ate our lunch of four soda crackers and a hunk of cheese, with plenty of cool water, while If chewed the green grass. Impelled onward, we soon stumbled into a patch of luscious *akala* berries (like blackberries) on which we feasted while our guide was trying to route us out for the long journey ahead.

We passed through fascinating country, where roamed numerous wild turkeys, quails, and pheasants. At four o'clock we stepped into patches of beautiful wild daisies, then into an immense *koa* forest where our souls were enraptured by the quilted sunshine through the tops of the forest monarchs. We took shelter in a little dell, as darkness approached. We called Dead Man's Gulch, since it is not a safe camp in stormy weather. There we build our first camp-fire and prepared a limited meal, then spending two bewitching hours watching our thoughts flitting among the burning embers. As the sparks grew dim our eyes followed suit.

### ***A Stove Without Dinner.***

Rolled outs, hotcakes, honey, and coffee were served on the morning of the 19<sup>th</sup>, while If received his portion of the whole corn on the cob, with green grass. Thus stimulated, we rambled south by east, enjoying the bracing atmosphere, the trees, and the meadows with their pretty wild flowers, and occasionally stopping to pick thimble-berries. We arrived at **Keanakolu** (three caves) early in the afternoon, where the ranchmen treated us to hamburg steak, pork chops, rice, hot cakes, milk and coffee. Loosening our belts, we proceeded southeast for seven miles, reaching Apuwai [**Hopuwai**] (drinking cup) at 5:30. Here was a two-room cabin with stove, and two full tanks of rain water. We got busy! One swept; another cleared the smoke stack of bird nests; one gathered grass for bedding; another gathered and chopped dry wood for the stove. Then, alas, our guide informed us that our rations were low, and, as we had two meals in one, three hours before, we were to get no more that evening. With a rueful look at the stove, we sat down to enjoy its warmth. Then we hear a grunt from If, and presto! his half bag of whole corn flashed on our minds. Soon we were popping corn in a double pan. This we ate in contentment, chatting until we were sleepy.

...Sunday morn, the 20<sup>th</sup>, the sun rose from a sea of clouds. After breakfast on oats, hot cakes, honey, and coffee, we bade farewell to "Rustler's Retreat" and hiked on southward over opening grazing land, for nine miles, arriving at noon at **Laumaia** (banana leaf). Though hungry as bears, we were allowed for lunch but one slice of bread with minced veal. Plodding onward we followed our guide for four miles through a dense fog and light rains, seeing huge owls on nearby mounds at intervals, which proved to be cattle when we got closer.

Passing through many gullies and between numerous cones, at two o'clock we arrived at **Puu Oo** (home of the *o-o* birds, long extinct). We could not see Mr. Shipman's ranch houses on account of the fog, until we were within fifty feet. Mr. Hunter of the ranch, invited us in to dry our shoes and clothing, while hot tea was served with biscuits. At five o'clock W.H. Shipman arrived from Hilo with Senator Robert Hind. We were welcomed to stay the night, and after a hearty dinner we gathered around the fire-place, when Senator Hind related interesting reminiscences of life on his ranch at Puuwaawaa (corrugated hill).

On the 21<sup>st</sup> we awoke refreshed by the first warm beds of the journey. The air was crisp. The Kentucky blue grass, growing here, was coated with crystal dew. There were gardens blossoming in a variety of beautiful flowers. Southward, over blue grass meadows, with lava slopes between, loomed the summit of Mauna Loa, with shining snow patches.

### ***Sandal Wood is Still Found.***

After breakfast our food supply was replenished with a roast leg of mutton and crackers. In the meantime, If had been shod (not shot) at sunrise, his hoofs needing reinforcing for the lava trail ahead. With deep appreciation of Mr. Shipman's hospitality, we sallied forth on the 32-mile hike to Kilauea volcano, where our supplies for the Mauna Loa climb awaited us at the military camp. *Mr. Hunter escorted us through the ranch lands to the 1899 lava flow, showing us along the way a number of sandal wood trees, from which the o-o birds obtained their food; also a corral of split sandal wood from dead trees.*

Reaching the boundary gate, we took a farewell look at **Puu Oo**, nestling serenely between cones on the 6000-foot elevation of **Mauna Kea**. Heading south by south-south-east, we trailed over the first *aa* flow from Mauna Loa; then *pahoehoe*; through scanty thickets of *ohia lehua* growing in this desert waste, stopping at noon for lunch in one of these thickets. After hiking 22 miles over this zone of oases, inhabited by wild goats, we entered a large *koa* forest, with tree molds (in the lava) for a mile, arriving at Keawewai at 5:30, as the mist was rolling in. Here was a stone cabin, with a fire place, corrugated iron roof, and tank of rain water adjoining. We took shelter for the night, eating a good supper of cold roast mutton, beans, crackers, and hot tea, then sitting around the fire until slumber invited.

### ***"The Lone Man's Trail" Ascent of Mauna Kea in 1925***

Fred Truman, a resident of O'ahu, determined in 1925, to walk to the summits of Mauna Loa and Mauna Kea. He published an account of his journey in the *Paradise of the Pacific* magazine (December, 1925), describing his journey from Mauna Loa, across the lands and lava flows that make up the Kipuka 'Aina Hou section of Humu'ula, towards Pu'u 'O'o, from where he would make his ascent of Mauna Kea. Of the trip, Truman wrote:

#### ***Tuesday, August 11, 1925.***

...As I continued my descent, small patches of scrub *lehua* and *ohelo* shrubs began to appear. Beside one of these clumps of *lehua* I came upon a mountain sheep. I stopped in surprise, nor would it move, being equally surprised, no doubt, to see me on that lava waste. I saluted the sheep and said, "My friend, have no fear of me for I am as far from my kind as you are from yours and we meet and part in peace; for, are we not in the same predicament in this desolate wilderness."

I passed islands of trees surrounded by lava and there were blind alleys that ended abruptly in the thick of a wood, causing me to retrace my steps and pick another way. There were white trunks of large trees, charred their base where hot lava had mown them down, and there were bones bleached white by the sun.

I marveled at the desolation about me and unconsciously quickened my step. Thus I came upon a dimly outlined lava trail crossing my path. Though it was late in the afternoon and though clouds were thick around me, yet I laughed gaily, such was my joy in finding a trail. Over this trail I moved rapidly in the direction of **Mauna Kea**, and thereon I saw six wild Hawaiian geese, which I was later informed, are very rare. There were more lava flows to be crossed, hills to be climbed and woods to be penetrated. These were quickly disposed of and an hour before dusk found me in a hilly grazing land wherein were many steer.

Here were innumerable trails and I knew not where the ranch house was located nor what trail to follow in order to reach it. Thus I climbed many grassy hills while the clouds hung low and a drizzling rain fell. At last, when the flow of the setting sun was reflected on the higher clouds and, as I was preparing to spend a cold and wet night in the open, a shining rectangle on a distant hillside attracted my attention. It disappeared immediately, because the clouds had moved between us, but I took this to be the sheet iron roof of a house and

immediately lined my compass in that direction. Again I set forth to climb more hills and gulches in the rain...it took almost two hours to reach the ranch...

Ioane Haa, a Hawaiian cowboy, 73 years of age and with a beard like a patriarch, guided me out of the cattle lands. He directed me, but his Kona English was a little beyond me, so I got few of the details. Nevertheless I learned there was a lake just below the summit called **Waiau** where water could be gotten.

Up and out of the clouds I climbed, but I had to move rapidly for those clouds followed close behind me. I did not relish a climb by compass, which would mean going over obstacles that otherwise could be avoided, so I worked diligently over the first few miles. Soon the clouds became stationary, permitting me an easier gait.

Wherein Mauna Loa is a huge mound of lava, **Mauna Kea** is a heap of ashes and boulders sprayed liberally with cinder cones both large and small. Dust from these volcanic cinders and ashes rose about me, for there was no breeze upon the higher slopes, and when I ventured I among the rocks and boulders I found them to be hot as stones from primitive bake ovens. Over scorching slopes I moved, slowly, and the air I inhaled was hot in my nostrils.

During the late forenoon I became very thirsty, but on opening my canteen I found it entirely empty. I had forgotten to fill it. No water! Heat waves danced the merrier, the sun beat down on bleak boulders and there was no sign of a breeze while here and there among the rocks were white bones bleaching in the sun. There was disgust within me for my neglect, and I called myself a brother to the jackass which is known as a Kona nightingale. But in spite of all that there was no water and water I must have. I dug with my trail knife in the damp ash of mountainside gulleys but none was there. I explored each hole and crevice, tramping back and forth and across. If there were heat waves I did not see them, nor did I know there was heat, nor was I conscious of the lack of breeze. Nothing mattered; I was looking for water. Somewhere among the cinder cones was **Waiau**, the lake, and I was seeking it. I came upon a few spots that looked like the bottoms of small and dried up lakes, but nowhere did I find water.

At last, in the middle of the afternoon, I sat down upon a rock for rest and thought. I had not yet found water, so to myself I said, "You are an idiot and a fool. You waste precious time and strength in frenzied racing around looking for a lake, when, with systematic searching among boulders and rocks you might find water in narrow and deep crevices, for it surely cannot evaporate very rapidly at this altitude."

A search revealed one such crevice but the opening was so narrow that I had to soak the water up with my handkerchief. After this I laid all of my equipment, excluding my canteen and trail knife, upon a high rock and set out in search; of more crevices. I found not a few of them, half-filled with gravel and water, and by placing my teeth against the gravel I could strain the precious liquid into my mouth and then transfer it into my canteen. It surprised me that in spite of the heat the water I found was ice cold. My teeth became sensitive to the cold but in an hour and a half I had filled the canteen. Then, before I could spot my equipment, clouds drifted up between two cinder cones, and filled the slope. Now began another mad search. I traveled back and forth among the rocks for an hour, vowing that should I ever find my roll of blankets and knapsack they should nevermore leave my shoulders while I traveled. Fortunately for me the clouds lifted and shortly after I espied my things. Now, that the excitement was over and that everything had turned out better than I could have expected, in spite of my assininity, I continued my interrupted journey.

I climbed three cones, but as the ones ahead always seemed higher, I gave it up as a man killing job. With dusk a cold wind began to blow while the clouds remained stationary at about the 12,000 foot level. I stood below a high crater with a smaller one adjoining it, awed by the vista before me. The mountain seemed a barren island set in a sea of gray bubbles. Here and there were larger bubbles and these were dark purple. The sun was sinking into that sea, the world was somewhere below, far, far away, and there was nothing above but the wind singing its ancient song among lone boulders, gaunt rocks and brooding cinder cones and craters that stood guard above this ash heap of the world.

The clouds were tinted a moment and then became a darker gray. The wind, sharp as a knife and cold, crept beneath my skin, so I could not watch overlong but rolled into my blankets and lay shivering and watching the sky. Darkness came swiftly. The cold stars came out; so close they were and so bright that among the boulders there were shadows. And that night I slept not at all but rubbed my hands and arms and limbs for the cold was so intense that sleep was not possible.

**Friday, August 14**

***Umikoa—My Descent of Mauna Kea***

Before dawn I slept, but upon waking I could not move, because each joint in my body was stiff and sore. I rolled out of my blankets and lay almost three hours on a flat rock in the sun, dozing and rubbing my joints in turn. The water was so cold that I could not take it into my mouth and the canteen froze to my lips.

There is an element in majestic altitudes that awes one. I can plow my way through a bog, cleave my path through a fetid jungle until my trail knife is hot and I sob under my breath for the pain in my muscles, and I laugh and thrill in the exertion in spite of the discomforts. But this aloneness and vastness, with only a cinder top above a sea of clouds that stretches into the infinite horizon, strikes deeply to the core of a man's being. Alone! Alone! The world is buried below that sea and you are all alone. Even the wind chants the rhythm of the solitude.

Of a sudden I wanted to be below those clouds. I would go down under that sea and into a world that was familiar to me. Had anyone else been with me I should have climbed that tall cinder cone under which I had slept. I should have found **Waiau**, the lake. I should have spent the day exploring and another night above those silent clouds. But I was alone and wanted to get down quickly as possible.

My compass lined for the closest point to the coast, I started at a jog over a long, rock-strewn plain that lay before me. Boulders and rocks and cinders were about me, and again those infernal green serpents, the heat waves, were dancing before my eyes. Yet lower and lower I went, sliding and stumbling down steep cinder slopes until the dust arose in a huge cloud behind me. Ever the clouds seemed to retreat, yet the air grew humid as I neared them. Then, of a sudden, they were all around me, their clammy fingers in my hair and at my throat, but it was hot even in the clouds.

The land changed as I descended. No longer lava cinders were underfoot. Jagged rocks lay piled in fantastic ridges and these were sprayed with grass, scrub *lehua* and shrubbery. In my mad descent I stumbled on three wild pigs and frightened a half dozen wild turkeys. My shoes were torn so badly by this time that I discarded them and donned my third and last pair. Passing under the clouds, I followed many sheep trails and soon came upon cattle lands with their many fences and cow trails, but these I did not follow, for I was traveling by compass to the coast.

In the middle of the afternoon I arrived at **Umikoa**, homestead of the **Kukaiau** Ranch Company. Here I was made welcome by Mr. and Mrs. Macalister. I learned that if I had gone a scant half mile to my right I should have found their trail; also, that **Waiau**, the lake is a short distance beyond the cone near which I passed the night. It took me five and a half hours to reach **Umikoa** from the summit of **Mauna Kea**.

After the comforts of a hot shower I was guest at an excellent dinner, and spent the night in a bed under warm blankets.

#### **Saturday, August 15**

**Umikoa** is a beautiful spot. The ranch house is hidden in the shade of tall eucalyptus trees whose fragrance is very noticeable. After a hearty breakfast, I bade my pleasant host and hostess farewell, and set forth along a newly built road to the town of **Kukaiau**, where I had to wait until noon for a train to take me along the gorgeous Hamakua coast to Hilo.

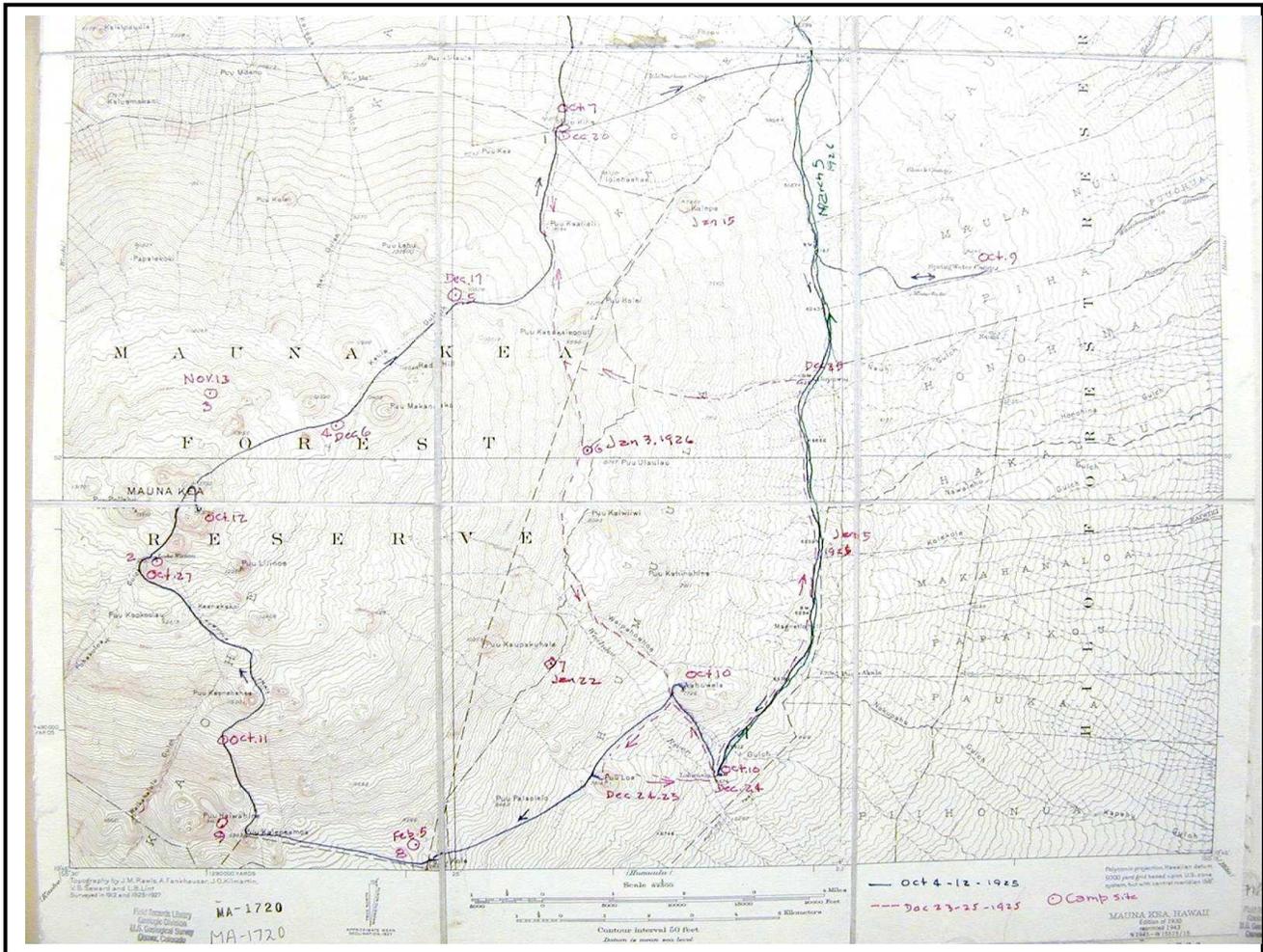
There were many people on the train, but of a sudden I had a dislike for crowds, the clatter of the wheels and the smoke from many cigarettes. Things were clean and big and silent up there, where I had been. There was space for one to move in physically and mentally; therefore, I had been afraid, for my small physical self and my microscopic mentality had been lost in the vastness of that region. Now, that I was returning to crowded things, where the elbow of one man's thought brushed against the rib of another's, I felt a twinge or regret at losing the thing I had but begun to find and appreciate... [Truman, 1925:55-58]

#### **Geologist's Survey of Mauna Kea by Jerome Kilmartin (USGS) in 1925-1926**

In 1926, the United States Geological Survey (USGS) sponsored surveys in Hawai'i. Jerome Kilmartin of the USGS was sent to Hawai'i, and spent five months on Mauna Kea. While reviewing records in the Denver collection of the USGS, a detailed journal of Kilmartin's work on Mauna Kea was located. The narratives refer to photos, unfortunately they were not kept with the handwritten journal, and could not be located in the USGS collection. The journal and photographs were published in the *Honolulu Advertiser* on April 18, 1926 (page 9), with a note that photos were by L.W. Bryan. The quality of the microfilm does not allow for adequate reproduction, and the photos are not included with the following narratives. *Figure 21* is a photo of Kilmartin's annotated Mauna Kea Quad Map, showing the routes traveled, and points of reference cited during his field work.

The accompanying photographs were taken by J.O. Kilmartin during the course of the detailed topographic mapping of **Mauna Kea** lasting over a period of five months during the past winter, from early October, 1925, until early March of the present year.

The party consisted of, in addition to the engineer, three Japanese, one Portuguese and one Chinese as assistants. The photograph (No. 1) shows the start from the base camp, **Puu Kihe**, the use of which was extended through the country of the manager of the **Kukaiau Ranch**. **Puu Kihe** afforded the nearest water supply for both mules and men and all water had to be packed by mule back sometimes a distance of 12 miles and a vertical distance of 6000 feet. One mule could pack only 20 gallons of water and once each week the pack train would come to the camp on the mountain to bring water, usually 80 gallons, as a weeks supply and a small quantity of food. Each man was allowed two gallons of water per day and this had to cover all of his uses for water, water for tea, washing, soup and rice, and his dishes. It was often necessary to use dish water several times straining and boiling it until used up. In addition to packing water all of the food, fuel, and equipment had to be transported. In fact every article that was used had to be brought from **Kukaiau** by pack train.



**Figure 21. Portion of Mauna Kea Quadrangle, Annotated by J. Kilmartin, 1925-1936; Depicting sites Visited and Survey Points on Mauna Kea (Original in Collection of USGS Library, Denver; Copy Photo, KPA-N171)**

From **Puu Kihe** camp the party moved to the summit lake of **Mauna Kea**, Lake **Waiau**, where it camped for almost three weeks. The mules were, of course, returned to the base camp for the region above timber is only a barren field.

On the trail to the summit (No. 2), the sharp peak in the middle foreground is one of the most prominent on **Mauna Kea**, Red Hill. It has an altitude of 11,854 feet above sea-level. The surrounding country appears to be good for walking or riding over but one traversing it in either manner grows tired easily due both to altitude and the nature of the cinder surface. The country in the immediate foreground is on the lower slope of the glaciated area.

(**Kanakaleonui**) The crater in the picture No. 3 is the largest on **Mauna Kea**. Its greatest diameter is about 1800 feet across and its longitudinal distance is approximately one-half mile. It has a depth of about 400 feet in one place. Just at the upper side can be seen a new crater found probably after the main crater became extinct. On the inner side of this new crater there are lateral streaks of a yellow substance so uniform in direction that they appear as the work of a human hand. The lower side of the older crater has a lateral vent which has emitted lava and is yet quite evident.

*The name of the hill is **Puu Kanakaleonui** and according to legend an aged Hawaiian lived once in this vicinity and possessed of a very powerful voice, would go to the summit of this crater and speak to his fellowmen in Hilo and villages along the coast. There is ample evidence to support the legend of human habitation in this immediate vicinity for several platforms were found. Two just on the upper side of this crater and several below to the northeast.*

The camp at Lake **Waiau** is shown in picture No. 4. Contrary to the belief of many the lake is not on the summit of **Mauna Kea** but about a mile to the southwest and at an elevation of 13,000 feet above sea-level. **Mauna Kea** does not have the central crater significant of Mauna Loa nor does it possess a single cone as a summit. It does have, however, a series of cones. Also contrary to general belief the lake is neither very large nor very deep. *In shape it is triangular and in color green. Late in the evening it is a beautiful jade-hue.* The size is very small being about 360 feet long by about 300 feet wide. It is reported to be of various depths, some infer that it is bottomless and some that it is only about 30 feet deep. Though no actual measurements were made at this time, it is reasonable to infer from measurements made on the depths of all the craters on **Mauna Kea**, and the deepest crater being about four hundred feet deep, that Lake **Waiau** is comparatively shallow.

The geological formation of Lake **Waiau** crater is widely different from anything yet found on **Mauna Kea**. For instance in this picture just behind the camp and on the crater rim can be seen a distinct line, indicated by a cross, that divides the crater into two entirely different sections geologically. To the left the crater rim is of a heavy basalt lava while to the right is of ash.

The climatic conditions of the summit plateau are varied and reach probably both extremes in temperatures in so far as the Hawaiian Islands are concerned. The lowest thermometer reading for early morning, 6 o'clock, was 13 degrees above zero, Fahrenheit, while the highest reading for afternoon was 103 degrees at about one o'clock. About 4 o'clock the thermometer registers around 90 degrees and immediately after sundown one and one half hours later, about 35 to drop steadily during the night.

The water at Lake **Waiau** is unfit for continual drinking. The taste is decidedly disagreeable even when used for making tea and coffee.

The only heat to be had in camp was from a small Rayo lamp which afforded more heat than the oil stove. During blizzards one could spend his time comfortably only in his bed roll.

The summit of **Mauna Kea** in No. 5 as seen from Red Hill. The main top is indicated by a small cross is 13,782 feet above sea level. The summit cones are arranged in a right angular formation, the longest side being in a north south direction. The arrow indicates the old summit of **Mauna Kea**. At least it is the highest lava outcrop to be found on the mountain. The lava area in the foreground is entirely unlike that to be found on **Mauna Kea** and travel over it is easy compared to that on Mauna Loa. ...According to the records of an old surveyor, "the skin and bones of a defunct cow." The bones and skin are in a good state of preservation though having been exposed for many years. The cone to the right in the picture bears the skeleton of several wild cows and whether these cows have wandered there and died or were shot by cowboys is uncertain.

Looking down from the summit towards Red Hill which is the second hill from the extreme right of No. 6 picture, as seen in the picture, is literally pitted with cinder cones and when

this area was active must have been a very wonderful scene beyond comparison to that which is seen today. In the distance, barely discernable, the fog is slowly coming in. To stand on the summit of **Mauna Kea** at sunset and see only Haleakala, Mauna Loa and Hualalai with their crests protruding above a solid cloud mass is a pleasure enjoyed by only a few. Colors change so rapidly and in almost a flash of a second they are gone. One evening the writer had the pleasure of seeing one of the most gorgeous sunsets that one could even hope to behold. Twenty craters were counted above the clouds and all were above 12,000 feet, each one a peculiarly in itself and remarkably well cast in relief by the golden accent of a setting sun. Fantastic clouds appear and are blown about by ever shifting winds to be caught in the rays of a dying sun. It all happens in the flash of a second but leaves mental pictures not soon to be forgotten.

**Keanakakoi**, the cave of the adzes is shown in No. 7. It was here that the Hawaiians obtained the stone (with which) to make their implements. In the foreground can be seen many old adzes discarded probably on account of being faulty. The cave seen in the lower right is where the men lived while fashioning stone. Inside it is very warm as it is well sheltered from the winds. Investigation showed that on their expeditions to the mountains they carried a variety of food, evidences of such being pigs, fowl, banana, coconut, and for light kukui was used. The quarry is at an elevation of 12,400 feet above sea level.

The glacial evidence as shown in photograph No. 8 on **Mauna Kea** is very striking even though it be only numerous striations made when the ice cap melted to slide down the mountain. The grooved appearance of the rocks in this picture is a fair sample though there are many striations on the south side of the mountain much deeper. This photograph was taken on the northwest side at an elevation of 12,000.

The crater in the foreground of No. 9 is named **Papalekeeki** and just on the north edge of the summit plateau. To the left is one of the last flows of **Mauna Kea** beyond the ice cap. On the summit of this crater is the carcass of a wild boar and at the time it was observed last November, it was in apparently good condition, skin and bone well preserved. It is interesting to note the different places and altitudes at which these remains of animals are to be found. Besides the two aforementioned cases there was found on **Puu Makanaka** (elevation 12,400) the carcass of a tiny mouse and well preserved. On **Puu Poliahu**, elevation 13,600, the carcass of a ram, and just below the summit crater on the west side, the skeleton of a mongoose. Wild horses and sheep were seen at an elevation of 13,000 probably going to the lake for water.

General conditions as regard exploration on **Mauna Kea** are liking of a bed of roses when compared to those of the writer's associate on Mauna Loa where everything used in connection with the work has to be packed by man's back, food, water and blankets being the heaviest items. The above picture No. 10, shows the method of pack transportation on **Mauna Kea**.

Snow on **Mauna Kea**, as shown in No. 11, is one of the most beautiful sights to be seen in Hawaii. It lends such a strong contrast to the tropical jungles below. During the past winter there were only two snows. This being the minimum amount in 26 years. [USGS, Denver Library Collection, Item No. NO-8248, Folder # 1]

### **The Mauna Kea Expedition of 1935**

The Hawaiian Academy of Science, in association with the Territorial Division of Forestry, the Hawaiian Department of the United States Army, the Civilian Conservation Corps, the University of Hawaii, the Hawaiian Sugar Planter's Association, the Bernice Pauahi Bishop Museum, the Parker and Kukaiau ranches and other parties, conducted a survey of cultural, geological and biological resources on Mauna Kea. A report remains in manuscript form in the collection of the Bernice Pauahi

Bishop Museum (C.K. Wentworth, et al., ms. 1935), though several reports and articles published subsequent to the trip are available. These published accounts include descriptions of cultural resources in the context of archaeological studies; botanical accounts, including a detailed description of the biological resources of Lake Waiau<sup>27</sup>; an overview of historic land use, covering the ranching period through 1935; the topography and geology of Mauna Kea; and detailed accounts of the glaciation of Mauna Kea<sup>28</sup>. For published extracts of the work conducted as a part of the Mauna Kea Expedition (1935), see articles that follow in this section of the study.

**“Climbing Hawaii’s Highest Mountain” (1935)**

**by E.H. Bryan, Jr.**

**Account of “The Mauna Kea Expedition of 1935”**

**Paradise of the Pacific, September, 1935:17-18**

Editor’s Note: The Honolulu Academy of Science has been conducting an expedition into the higher reaches of **Mauna Kea**. Hawaii’s highest mountain, whose summit tops 13,784 feet. The advance guard of the expedition recently scaled the great cone to make a reconnaissance of the summit, and to establish camps on the way up. The experience is related by E.H. Bryan, Jr., curator of the Bishop Museum, the article containing material of unusual interest. Because of its timeliness and scientific angle, it is reprinted herewith from the Honolulu Advertiser.

Having established a base camp at **Humuula** sheep station, the next step for the advance party of the Hawaiian Academy of Science’s **Mauna Kea** expedition was to make a reconnaissance of the summit of **Mauna Kea** and the rout up, and to start to establish a camp at Lake **Waiau**, 13,007 feet elevation, located about a mile from the great cinder cone which marks the 13,784 foot summit. This was begun August 1 six days before the main party was due to arrive.

Through the cooperation of the C.C.C., a string of a dozen mules had been obtained, and had arrived the evening before, in charge of John Harvey and Tom Lindsey and Tony Cruz, tired after a 33-mile trip from the camp near Waimea. Early in the morning William A. Hartman, project director for the C.C.C., and Alfred K. Bell, camp superintendent, both graduates of the University of Hawaii, class of 1926, arrived in a Ford station wagon, to help the party on their way.

**Humuula** is located in an area of grassland on the sand and bare lava-covered saddle between Mauna Loa and **Mauna Kea**, at an elevation of 6,700 feet. The slope of **Mauna Kea** begins immediately to the north of this little group of barns and houses, which are enclosed in a square of tall cypress trees, making it a conspicuous landmark.

To the north and west the slope is studded with great cinder cones, which rise from 100 to 400 feet above the surrounding land. To the south, toward the long slope of Mauna Loa, on the side of which numerous lava flows stand out plainly in the clear air, rises a single wooded cone, **Puu Huluhulu**, marking the edge of a broad sheet of rough, bare lava.

<sup>27</sup> In 1940, Constance E. Hartt and Marie C. Neal, members of the 1935, Mauna Kea Expedition, published a paper titled “*The Plant Ecology of Mauna Kea, Hawaii*” (Ecology, Volume 21, No. 2. April 1940:237-266), in which they described the environmental zones and plants found on Mauna Kea, and also described the biology of Lake Waiau in some detail.

<sup>28</sup> For a detailed account of glacial activity on Mauna Kea, see H.E. Gregory and C.K. Wentworth, “*General Features and Glacial Geology of Mauna Kea*” in the Bulletin of The Geological Society of America, Volume 48, pp. 1719-1742 (Dec. 1, 1937).

Both grassy meadows and cinder slopes are dotted with *mamani* trees. Further west, toward the **Pohakuloa** C.C.C. camp, these grow thicker and are interspersed with *naio* or false sandalwood, with here and there a tree *Euphorbia*. The only other vegetation consists of weeds and grasses, conspicuous among which are purple thistles, the downy, white *pappi* of which float like snow flakes in the air high overhead. Higher on the slopes, above the 9,500 foot level where the *mamani* trees reach their upper limit, grow scattered *pukeawe* bushes. Bird life consists of numerous skylarks, a few mynahs, an occasional migrant plover or turnstone, and a plump little native olive green creeper. At 6:45 in the morning our party of six started out from **Humuula** with Bill Hartman in his specially-gearred station wagon. It consisted of Sgt. Austin Collins, Sgt. Sumner Griffin, Sgt. Clifford Poutre, Plc. Clarence Raine, Robert T. Aitken, and the writer. A rout (hardly a road) runs up the slope to a house and water tank constructed by the C.C.C. at an elevation of 8,000 feet, just above the great red cinder cone of **Hookomo**. Up this rough slope we went, winding in and out among rocks and trees to an elevation of about 7,600 feet, where the car, even in super low refusing to haul the load, we hopped out and took to the trail. For another two miles this trail parallels a fence, to an elevation of about 8,700 feet, just below **Puu Kalepeamoe**, another great cinder cone.

Passing through a gap between this and another cone, we traversed a series of sandy basins, edged on the west by a line of cinder cones. Here the *mamani* trees become more scattered, with many dead limbs, and soon they cease to grow altogether, leaving only a few low *pukeawe* bushes to break the slope of jagged rock and cinder cone. Here [page 17] at 9,500 feet the real ascent begins, rising to an elevation of 11,000 feet in less than a mile (in a straight line), with soft sand or pieces of broken lava which roll under foot.

One begins to think that one will never reach those dark gray cones, high on the skyline, which mark the top of this steep slope. But having reached and passed them there are still three miles to go, across soft cinder and jagged broken rocks. The top of the great dome is covered with cinder cones. The trail skirts the foot of a great red one at 11,500 feet. Ahead to the right are three, to the left two, and far away, where these two lines intersect, an enormous double cone, the tip of which reaches an elevation of 13,784 feet above the sea, the highest elevation between California and New Guinea.

Now we have reached an elevation of 12,000 feet, and the lack of oxygen in the atmosphere is beginning to tell upon us. We stagger fifty paces and have an overwhelming desire to stop and rest. We dare not sit down even on convenient and tempting rocks, for then we would have no desire to get up again and go on. Fortunately the mile of trail from 11,750 to 12,500 feet elevation is much less steep than what we have just gone over, with one stretch almost level, so we manage to keep going, panting for breath the while.

*Ahead now rises the low bluff of Keanakakoi, and for the moment we forget the scorching heat of the sun, the drag of our feet, the dryness of our throats and the pounding of our hearts, as we search the slope for signs of the piles of basalt chips discarded by ancient Hawaiian adz makers, and the low caves in which they took refuge while on these adz making expeditions. Evidence of their work is easily to be seen, and we wonder why these hardy artizans of long ago came all this distance to obtain rock for their tools.*

The last half mile before reaching Lake **Waiau** is the hardest of all. One crosses an area of broken rocks and then makes a sharp little rise up the slope of the cinder cone within which the lake is located. Topping the crest we look down, not upon a clear blue mountain lake, such as one is accustomed to see in the high Sierras, but a little gray green puddle, only a hundred feet or so across. The margin is bordered with green scum, and the whole is suggestive of thin pea soup. It is icy cold, however, and although a little moldy to the taste, is, we are assured perfectly good to drink.

The first of our party reached the lake at about quarter of four, after nine hours of steady going, that is, intermittently steady, for we stopped to rest a dozen times in the last two hundred yards, and proportionately often below. All had assembled by five o'clock, but where were the mules? At last we espied a cloud of dust far down the trail and two persons on mule back appeared. Finally the two riders dismounted and approached to within hailing distance of Sgt. Collins, acting as lookout on the crest, and he saw that they were Bill Hartman and Alfred Bell. "Bad news," they sang out. The mules have run away; bucked all the packs off. You'll have to get started right away if you want to get down to timber line before dark."

Hartman and Bell had come all the way up, coaxing, urging and dragging the mules, in about four hours, to save us from freezing and starving on the shelterless summit. It was now ten minutes of six, and nearly exhausted with the trip up, shivering with the cold, now that the sun had sunk behind the cloud banks, and with no hot food since breakfast, we were faced with a most difficult situation.

*We quickly filled every container in sight—with water from the lake, and staggering over the crest of Lake **Waiau** crater, set out across country for the red cone which marked the start of a followable trail down. We had one gasoline lantern, and Bell had a flashlight. We stumbled on, the night growing darker and darker, with only a slender crescent of moon in the western sky. How we made it in the darkness without an accident will remain a mystery. In places Bell, who had made some twenty previous trips up the mountain, set a course entirely by compass. Usually we could feel some semblance of trail under foot, although we hit every rock in it. Kept going, under the urge of necessity, by some strange reserve of strength, we made it back to the waiting Ford truck at **Hookomo** in about four hours, and we back in **Humuula** by 10:30, ready for a fine hot meal which had been prepared for our return.*

The mules, it seemed, had staged a kind of rodeo. The supplies and equipment destined for the summit camp had been picked up over an area of several square miles. Our stay on top was off for the present, and as Aitken and I would have to return to Honolulu before we would have time to make another attempt, we decided that we might as well try to catch the S.S. "**Humuula**" the following day. We did, but only after adventures almost as exciting as those of the day before.

From **Humuula** to Kawaihae is some 42 miles, 25 of which should be classed as motorists' nightmares. After being up until midnight the night before, no one felt like getting started until about nine in the morning. We thought the steamer would not get away from port until after 2:00 p.m. but calling up Parker Ranch on the phone we learned that the boat was due to leave at 12:30. Then the fun began.

Piling into the Chevrolet sedan, driven by Plc. Wilson, Aitken, Porteus and I, with our baggage piled all over us, held on for dear life as the car raced down the bumpy road. The first setback occurred when we got stuck in the sand and had to dig out. Then at Waikii, going thru the "cornfield" detour the timer became filled with dust and refused to time. Finally getting the car going again about a mile down the road we had a flat tire. Then we discovered that the spare tire was soft and ready to go any moment. So we crept down over the bumps until we reached the paved road.

Racing to Kamuela, the storekeeper got a phone call through for us just in time to have them hold the boat, and thirty minutes later, despite timer and tires, and thanks to Wilson's skill we were safely aboard the S.S. "**Humuula**," bound for Honolulu. [page 18]

**“Mauna Kea, The White Mountain of Hawaii” (1935)**

**Account of “The Mauna Kea Expedition of 1935”**

**by Chester K. Wentworth<sup>29</sup>**

**Leader, Hawaiian Academy of Science’s Mauna Kea Expedition**

**Mid Pacific Magazine, October 1935:290-296**

The uplands of Hawaii remain to this day but little known. Above the 4,000-foot contour, an elevation which only the highest peaks of the other islands of the Hawaiian group attain, we find a largely uninhabited upland region on Hawaii into whose area all the other islands of the group could be stowed without squeezing. A large part of this area consists of the mountain masses of Mauna Loa, Mauna Kea, and Hualalai. These three domes, although topographically surveyed, and although they have been sporadically visited by scientific parties for more than a century, are still virgin territory to the scientist.

*The native Hawaiians avoid these high regions. They showed great reluctance about accompanying early exploring parties from the visiting ships who wanted to see what was above the forests. Trails, which started mauka in such numbers from the populous sea-coasts, soon ended when they reached the limits of native gardens, the haunts of pigs, and the area in which koa logs suitable for making canoes, and kauila trees for spears, flourished. Only the venturesome and hardy guild of feather gatherers, and a few adz quarriers, ventured far afield.*

With the coming of white men all this changed. Their clothes and foot-gear were more favorable for making such journeys; and they were not hampered by superstitions. The first ascent of Mauna Loa was that made by Archibald Menzies, botanist with Vancouver, who set out around the south side from Kona on February 5, 1794, and attained the summit on February 16. The summit of Mauna Kea was not reached for nearly thirty years after that, the first recorded ascent having been that of Goodrich in August, 1823. James Macrae, botanist with H.M.S. *Blonde*, ascended Mauna Kea in 1825, remaining on top from June 15 to 17. After that the summit was visited by a number of scientists, including David Douglas, botanist, on January 10, 1834, and Dr. Pickering and Mr. Brackenridge from the U.S. Exploring Expedition, in 1841. This same expedition, under the command of Commodore Wilkes, with the aid of over 200 porters, camped in Mokuaweoweo crater on the summit of Mauna Loa from December 14, 1840, to January 23 1841. [page 291]

As a result of these various reconnaissance trips, the part of Hawaii above the 10,000-foot level became almost as well known by 1841 as it was down to ten or fifteen years ago. Although occasional parties, traveling on horseback, have ascended to the summits, there has in recent years been but little systematic addition to the published knowledge of these regions. Lack of practical occasion, the expense involved, and difficulty of traveling and camping above the timber line have discouraged detailed or systematic observations by individual naturalists. Many of these have made hurried trips to the summits in the hope of adding to impressions gained around the fringe of the high zone. But in nearly all cases they have, upon their return, found themselves asking more questions than they have been able to answer, and regretting that they had not had time and means to study the summit in more detail. In August, 1935, the Hawaiian Academy of Science, to celebrate ten years of existence, thought that it would try to assist a group of Hawaii’s scientists in adding to their knowledge of high-level geology, meteorology, entomology, zoology, botany, and archaeology, by sponsoring an expedition to the summit of Mauna Kea.

This mountain was chosen, rather than Mauna Loa, because its summit is so much older, and its natural features so much more maturely developed than on Mauna Loa, where the surface is even now in process of building by volcanic outpourings. The presence of a

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<sup>29</sup> With substantial assistance from E.H. Bryan, Jr.

periodically active volcano on Mauna Loa has also caused its upper slopes to be a little better known than those of Mauna Kea. As a result of its greater age and more diversified surface features, Mauna Kea offers a greater variety of geological, botanical and zoological problems, to say nothing of archaeological sites, while displaying a similar climatic contrast to the typical conditions of the surrounding lower slopes. Here is a mountain summit where water freezes every night in the year, overlooking palm-fringed beaches of coral sand where moonlight swimming is enjoyed in midwinter. Snow falls abundantly in winter at the summit and lies in banks on the north and west slopes into early July. In a region with the mild and uniform climate of Hawaii, such contrasts are startling and intriguing, and furnished impetus for the 1935 expedition.

A small group of members of the Academy laid the initial plans for a summit camp. When the enterprise had been endorsed by the Academy and had been assured of cooperation by the Bishop Museum, the University of Hawaii, the Sugar Planters' Experiment Station, and other scientific groups, application was made to the Hawaiian Department, United States Army, for assistance in the practical operations of pack train transport, camp maintenance, and management of the mess. This re- [page 292] quest was granted by Major General Hugh A. Drum, Commanding the Hawaiian Department, and Lieutenant (now Captain) H. A. Meyer was assigned, with nine enlisted men, to take full charge of these matters.

No army mules were available on Hawaii, and accordingly the cordial cooperation of the Hawaii unit of the C.C.C. in furnishing a dozen mules and three packers was greatly appreciated. The Parker Ranch, through the courtesy of Alfred Carter, Trustee, and his son, Hartwell Carter, Manager, gave every assistance to the expedition, including the use of the sheep station houses at Humuula. Besides transportation facilities furnished by the army, the expedition was also greatly aided by almost daily carrying of goods in trucks of the Parker Ranch and C.C.C., traveling from Waimea to the camp of the latter organization at **Pohakuloa**, six miles from **Humuula**.

The chief difficulties met by the expedition were those of transportation. Much of the road above Waikii was very difficult for automobile travel because of the thick layers of powdery volcanic dust. An even greater difficulty was met in the uncertainty of transport by imperfectly trained mules. Several of the early pack trains came to naught because the mules went on a rampage and bucked off all the equipment with which they had set forth. There was much labor and confusion in gathering up the widely scattered articles of bedding, wearing apparel and culinary supplies and equipment.

Seventeen blankets and a tent were "lost" in this way, and in the course of operations there was much spirited radio discussion between the summit camp and the Humuula base camp as to the blanket tally. These seventeen missing blankets were not at the base camp; and no one who witnessed the nightly partition of blankets at the summit into what seemed before morning like very meagre allotments could believe that anything remotely like a blanket was overlooked at **Lake Waiau**. The distress of the bookkeeping department was relieved just as camp was breaking up by the revelation that one of the packers, after one of the mule rodeos, had placed the 17 blankets and the tent in a tree for safe-keeping, and had forgotten about the incident in the press of other matters.

Fortunately, some skeptics among the army men at base camp had withheld all instruments and delicate equipment from inclusion in the first packsaddle bundles, and much loss and damage had been avoided thereby. A few pots and pans, and a stove or two, were [page 293] most amazingly tangled by the mules in their annoyance. but no serious loss was incurred.

The effect of the lowered atmospheric pressure at **Lake Waiau** on the boiling point of water was of both scientific and practical interest. At a pressure corresponding to less than 19 inches of mercury the boiling point of water was reduced to about 189 degrees Fahrenheit. At this temperature about one and a half hours were required to boil potatoes of moderate size, and coffee, hot off the stove was not hot enough to allow the addition of any liberal amount of cream.

The addition of a pressure cooker to the equipment effected a very great convenience in speeding up the cooking operations and in providing means for baking, which had previously been lacking. With it cooking could be done as rapidly as at sea level and with much less water loss. At first the difficulty in cooking had been anticipated by planning the use of a large proportion of canned goods. Later, because of the difficulties of pack train transport, the mules injuring their feet on the rough rocks of the upper slopes, an effort was made to use lighter and more concentrated foods which was possible because of abundant water supply from Lake Waiau and its marginal springs. The use of dried fruits and cereals, with provisions for pressure cooking to save both time and fuel, would clearly be best for any extensive camp operation at Lake Waiau.

Although the bracing air would have made it most agreeable, there were none of the roaring campfires which one associates with camping in many regions, because of the complete lack of fuel. The forest ends at or below the 10,000-foot level, and to transport wood three or four miles up to **Lake Waiau** at 13,007 feet would be both costly and laborious. Within a few minutes after sundown the air temperature dropped each night to a few degrees above freezing; and before morning ice was forming on quiet pools and the edges of the lake. Partly because of the cold and partly because of the fatigue of daily toil at the high altitudes, all members of the party were ready to take to their bed rolls or sleeping bags soon after sunset. Cooking was carried on very satisfactorily on two portable gasoline stoves, using about two quarts of gasoline per day to cook for an average of eight persons.

Most members of the party noted some physiological effects of lowered atmospheric pressure between Humuula and the 10,000-foot level, and all suffered an increased shortness of breath in the summit area. Some suffered either a slight nausea or considerable headache; but most of these effects tended to wear off after a day or more at the summit camp. All those remaining at the summit camp were able to carry on reasonably effective work, although over lesser areas and with more fatigue than would have been felt at sea level.

The high part of **Mauna Kea** is a great dome with steep slopes from the 8,000 to 11,000-foot levels, and flatter slopes above 11,000 feet. It is marked by scores of red or black cinder cones, each a few hundred feet high, and usually with a central bowl a few scores of feet deep. Surrounding the cinder cones in the region above 10,000 feet, which has an area of more than 50 square miles, are broad expanses of glacial moraine, or of ice-scoured lava flow ledges strewn with boulders perched by the ice. In its simplest as- [page 294] pects, barring certain exceptions, we may say that **Mauna Kea** was first built as a lava dome to nearly its present height. It was then the site of numerous explosive eruptions which produced the numerous cinder cones. After that a change in climate that was world-wide brought about an increased precipitation of snow on the mountain top, and as it accumulated an ice cap, or calotte, was formed which spread outward and gave rise to several radial glacier tongues.

Although the former existence of glaciers on **Mauna Kea** had been recognized and announced by Daly in 1910, evidences of them seen by various geologists since then, and a particular study of them made by Dr. Herbert E. Gregory, Director of the Bishop

Museum, several years ago, the 1935 expedition made possible a more nearly complete study. Through the observations of the various members of the party it was made clear that more than 25 square miles of the summit area was covered by glacial ice and that the ice reached a thickness of at least 300 to 400 feet in places. All were struck by the freshness and clarity of the glacial markings on rock which must have been exposed to the elements for at least 20 to 30 thousand years.

There were probably several periods of glaciations, as in North America, and the last of these gave way to the interglacial epoch now prevailing. At present, and for some thousands of years, the rocks of the summit area have been subject to marked frost action, and some of the ledges previously smoothed and striated by glacial action have been very notably split and quarried into characteristic frost-formed spalls.

The rock debris and soil cover due to glacial erosion as well as that due to modern frost action is notable for its light gray and cream colors, in contrast [page 295] to the deep red and brown colors of Hawaiian soils and weathered rocks near sea level. The latter colors are due chiefly to chemical weathering in a warm, moist climate, a process typically called lateralization. On the contrary, at the high levels on Mauna Kea even today the temperatures are so low, with freezing every night in the year, that the rock — breaking and soil — forming processes are chiefly physical rather than chemical, and of a type found typically in Alaska, the northern Scandinavian countries, and Siberia. Here, as on the summit of Mauna Kea, the products of weathering are light in color. Apparently the red colors of the higher cinder cones are due to the original heat of the eruptions, and were developed immediately after the eruptions took place and only on the surfaces of the cones. The inner parts of most of the cones which were not exposed to the air are black, the natural color of unweathered basaltic rock or glass.

A report on the expedition will be presented at the fall meeting of the Hawaiian Academy of Science; and the more technical results of collecting and research will be forthcoming from various members of the expedition or specialists to whom the specimens have been submitted for study, in appropriate scientific publications.

Thanks to all the cooperation which was received from scientists, the Hawaiian Department of the Army, the Coast Guard Cutter *Itasca*, which carried the advance party and equipment from Honolulu to Hilo, the C.C.C., the Parker Ranch, and many individuals, this first expedition of the Hawaiian Academy of Science was a success, and sets a creditable precedent for future similar undertakings. [Wentworth, 1935:296]

### **“Snow Storm in Hawaii” (1937)**

**By L.W. Bryan, Associate Forester**

***Paradise of the Pacific, February 1937***

Late in December, 1936, the first real snow of the season fell on **Mauna Kea** and caused local skiing enthusiasts to take their skis out of storage and go over their equipment preparatory to a trip to the snow fields.

The first party of the season to make the attempt started out from Hilo on Monday, December 28<sup>th</sup> and spent the first night at **Pohakuloa** 6,500 feet elevation. E.E. Tillet, Jack Bryan, Manuel Pimental and the writer made up the party. Early on Tuesday morning we drove by car to **Hookomo**, 8,000 feet, where a start was made at about 7:00 a.m. Unfortunately, the sky was overcast and shortly after we started out it began to rain, a real cold rain that turned into snow at about 10,000 feet elevation. The snow continued growing more heavy as we proceeded upward so that by the time we reached **Lake Waiau**, 13,000 feet, we were in a real snow storm, my first since 1920.

In addition to skiing we had planned to do a little ice skating on **Lake Waiau**, which freezes over during the winter months sufficiently thick to bear the weight of several people. We had borrowed our skates from the **Humuula** Sheep Station. We found the Lake frozen over but the ice was covered with about one foot of newly fallen snow and was not very thick for it began to crack as soon as we walked on it.

Skating being out of the question we tried to ski but were not very successful in this due to the extreme cold and the fact that the snow was fresh and not very well packed.

After a short stop at the Lake it was decided to return to a lower elevation for food and warmth. Excellent time was made going down and we reached the Rest House at **Halepohaku** at exactly noon. A good fire was soon underway and with hot coffee (from our canteens), and toasted sandwiches, we soon forgot the cold.

All except Jack who had spent all of his eleven years here in sunny Hawaii and had never seen a real snow storm or experienced such cold and so did not realize that it is necessary to keep the blood circulating by hard rubbing if needed. Upon his return he found that a spot under his chin was unusually sore. Examination by a doctor brought out the fact that he had been frost-bitten, a strange experience for Hawaii.

In spite of the heavy fall of snow the new trail to the top was easy to follow. This trail was built by CCC boys during the early part of the year and is well marked by ahus, or piles of stones, placed every few feet along the trail. This makes the trail very easy to follow in any kind of weather.

At present it is possible to drive a car to a point about one half mile beyond **Hookomo**. On one occasion a specially [page 18] equipped station wagon made the trip right up to Halepohaku at 9,500 feet elevation. Perhaps in the not too far distant future it will be possible to construct a secondary road as far as the Rest House so that cars may be driven right up to the snow line. Then when the "between the mountain road" is built it will be possible to drive direct from Hilo to **Mauna Kea's** snow fields in less than two hours. A road to Halepohaku would be a great asset to Hawaii and would open up a new winter playground on the Big Island. [page 19]

### **"Wild Sheep in Hawaii" (1937)**

**By L.W. Bryan, Associate Forester  
Paradise of the Pacific, March 1937**

Towards the end of the eighteenth century the first sheep were brought to Hawaii by the English and liberated on the different islands. A tabu was immediately placed on them and they were permitted to multiply without interference. In some sections they have been running wild for many years and are now quite plentiful in several sections particularly so on the slope of **Mauna Kea** on the Big Island. Conditions in Hawaii have been most favorable for the natural development of animals of this kind. Ample forage, few natural enemies (only man and wild dogs), and twelve months grazing season have made these islands a veritable paradise for this species and as a result they have increased enormously and, together with wild goats, have been responsible for considerable damage done to our native forest cover.

Within the **Mauna Kea** Forest Reserve wild sheep are quite common (estimated population of 40,000) and do much damage to tree growth and prevent any natural reproduction of the native species particularly the native *Mamani* (*Sophora Chrysophylla*). In some sections they have prevented any natural reproduction for many years past, and if this state of affairs was allowed to continue it would only be a matter of time before our mountains would be without a protective covering.

Realizing this the Territorial Division of Forestry has been attempting to rid this reserve of these pests in order to assist nature in her program of natural reforestation. This reserve area contains nearly 100,000 acres of rough mountainous country, extending from about 7,000 feet to the top of the mountain, which is nearly 14,000 feet high. The work of eradicating these animals had been proceeding slowly up to two years ago when the Federal Government offered to assist us in our conservation work through the Civilian Conservation Corps. Since then this work has gone ahead more rapidly and is now a recognized project. During the past year a total of 15,875 wild animals have been killed on the Island of Hawaii and of this total 9,167 were killed by the CCC who expended 865 man days on this work project. Many of these animals were shot and the meat utilized in our different CCC camps but by far the largest number have been captured in organized drives which are held in cooperation with adjacent land owners and ranches.

In order to successfully conduct these drives good fences are necessary and during the past year and a half the CCC boys have been busy building a sheep and goat proof fence around the entire boundaries of this reserve area. This fence is now almost complete and when finished will be over fifty miles long. This is the longest fence in the Territory and is well built of woven wire strung on strong posts cut from the native *Mamani* trees. This wood is very durable and will last for years. With this fence to work with the killing off of these sheep should prove much easier.

Recently a large drive was held above Waimea in cooperation with the Parker Ranch which furnished thirty cowboys and all riding animals needed. This drive covered an area of between ten and twelve square miles along the reserve boundary between **Puu Laau** and **Puu Kemole**. About forty men took part with only one lady, Mrs. Ernest H. Podmore of Honolulu, who was the only one of her sex to participate. The cowboys left Waikii at 4 a.m. under the leadership of foreman William Kaniho, and six hours later had driven the last of the sheep into the corral located near **Puu Nanahu**. Thus the actual drive required only six hours but they were all full hours of hard riding over rough country that only trained men and horses can travel over and still keep up with the sheep. Much credit is due to "Willie" Kaniho and his well trained cowboys for their excellent work. Twice during the drive it appeared as though the animals would break back and once they seemed to succeed but the boys were after them and soon out-flanked them and gradually turned them up hill again towards the corral. And again, just before the last big flock had been driven into the pen, one old ewe became suspicious of what was in store and started off down the mountain with about one thousand of her followers behind. However the boys were on the watch and just managed to turn her back and with her went the rest of the flock. Once safely in the corral our troubles were over.

The actual killing of over 3,000 sheep is quite a problem. It must be done quickly and in a humane manner. Shooting is out of the question on account of the expense and danger to those around. It is not a pleasant job at best but a sharp knife, properly handled, is one good method. The animal is captured by driving small numbers into an inner pen, quickly stunned by a sharp blow on the head and then dispatched. Many of the animals are old ewes and rams that are worthless for food and so are thrown away. With [page 19] the good meat it is different, an attempt is always made to save and utilize the best of it and during the recent drive over three hundred carcasses were saved and given away to such organizations as the Salvation Army, Father Louis' Boys' Home, Waiakea Settlement, W. P. A., Puumaile Home, etc. The skinning and packing out of this meat was done by CCC boys from the Waimea Camp after their usual working hours. They gave freely of their own time as a donation to those less fortunate than themselves. This drive was conducted under the direct supervision of Mr. A. Hartwell Carter, Manager of the Parker Ranch and the killing was done under the direction of Forest Ranger Duke Kawai and the CCC Project Superintendent W. A. Hartman. It took twenty-five boys two long days of 13 hours each to complete the killing and disposal of the dead sheep.

The results of our attempts to rid our forest areas of these injurious animals have been most encouraging in certain sections which we have fenced off and removed all animals. These areas are now growing up with native trees and other plants and indicate what can be accomplished once we rid this reserve of most of the wild animals. Many of the large rivers, which feed the agricultural lands below, rise in this area and it is essential that we have a good forest cover. By getting rid of these animals we can expect considerable assistance from nature in reforesting these slopes. [page 31]

### **“The Big Fence on the Big Island” (1937)**

**By L.W. Bryan, Associate Forester  
Paradise of the Pacific, April 1937**

On the 29th of January, 1937, the longest fence in the Territory of Hawaii was completed by CCC boys. It is around the entire boundary of the **Mauna Kea** Forest Reserve—the second largest reserve in the Hawaiian Islands. This project, which is part of the Territorial Division of Forestry’s conservation program, was done under the direction of Project Superintendent W. A. Hartman. He was ably assisted by foremen Duke Kawai, Manuel Adrian, John Liana, J.J. Ignacio and Manuel Pimental. Much credit is due all these men, and to the enrollees who worked under them, for the fine accomplishment.

This fence is made of extra-heavy galvanized stock wire. It is fifty-five inches high and is stretched tightly on large posts of *Mamani* wood. All openings are stock proof and it will turn all kinds of stock very effectively.

Actual construction work was started in June of 1935. A total of twenty months was required to complete the work on the fence which has a total length, including necessary corrals, of fifty-five and one-half miles. Eighteen thousand five hundred and thirty-six man-days were expended on all work connected with this project. The total cost, including an allowance of \$2.50 per day for enrollee’s time, amounted to about \$72,000 or \$1,300 per mile.

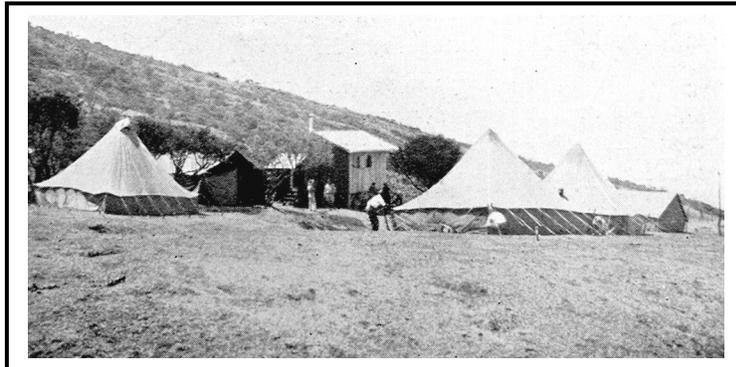
A great deal of preliminary work was required before the actual construction of the fence began. First, it was necessary to build many miles of horse and truck trails and tractor roads. In connection with the fence line alone nearly sixty miles of horse-trails were constructed. This trail was used to pack in the fence wire and other supplies. It was made permanent for future use in fence patrol and wild animal eradication work.

Most of the fence work was above the eight thousand foot contour. Camp locations had to be selected, shelters constructed, and water tanks installed. These camps were located as close to the fence lines as possible and placed at intervals around the mountain approximately four miles apart. This made the maximum distance from camp to work about two miles each way. At each camp site it was necessary to construct a corral for the work animals. Practically all feed, and part of the water, for these animals, had to be transported to the camp site.

Nine line camps were used [Figure 22]. Seven of them had to be constructed in advance. These camps were made on the same plan; one small building with water-tanks alongside in which could be stored between six and eight thousand gallons of water. The building was used as a cook-house and store-room. The boys lived in tents.

During the winter months it becomes quite cold on **Mauna Kea** and it was found that seven blankets per boy was not too much cover. Frequently the thermometer registered below freezing and at the **Puu Loa** Camp last February it was necessary to stop work for three days due to an exceptionally heavy fall of snow which covered the ground in that section and prevented work on the fence line. This was the first time most of the boys had

ever seen snow close at hand, but in spite of the cold they seemed to enjoy the experience. During the winter months each tent was furnished with a small oil heater that made the evenings more comfortable.



**Figure 22. Kemole Camp of the CCC Fence Gang (Copy Photo KPA-N841 (2)).**

The completion of this fence concludes one of the most important conservation projects attempted by the CCC in the Territory of Hawaii. It completely encloses and protects a reserve area containing approximately one hundred [page 15] thousand acres [Figure 23]. The important Wailuku River—which furnishes the water-supply for the City of Hilo—as well as several other large streams that supply water to Hilo and Hamakua Districts, have their source within this area.



**Figure 23. New Fence above Puuloa (Copy Photo KPA-N840).**

This reserve has, for many years, been overrun with wild sheep, there being an estimated population of about forty thousand. These animals do much damage and of recent years have effectively prevented any natural reproduction of the predominating tree growth—*Mamani*. With this new fence completed it is now possible to conduct drives and reduce the number of these animals to a minimum. In a recent drive, held since the fence was completed, over three thousand wild sheep were captured and killed in a single day.

After these animals are exterminated we can expect considerable assistance from nature in our reforestation work. On a small scale this fact has already been demonstrated so we

feel assured of ultimate success. In some sections, where seed trees are lacking, it will be necessary to assist nature with reforestation; but where seed trees have been left we can expect to see a new generation of plants occur naturally. [page 30]

**“Wild Cattle in Hawaii” (1937)**

**By L.W. Bryan, Associate Forester**

**Paradise of the Pacific, September 1937**

Captain George Vancouver brought the first cattle to Hawaii from California in 1793-1794. They were landed and liberated at Kealahou, South Kona on the Big Island. As with other introduced animals of the same period, a rigid “*kapu*” was placed on them in order to permit them to multiply. This they did with a vengeance and within a comparatively short span of years they became quite common on all the islands, particularly on Hawaii where they found many hundreds of acres of good pasture lands.

Over a period of many years they were slaughtered by men employed for this purpose by the King, principally for their hides, which at one time formed one of the principal articles of export from Hawaii. Experts were employed by the King to go into the mountains to shoot and rope these animals. Only a small amount of the meat was used, some of it being salted and sold to the whaling ships that wintered in these waters at that time. Many of them were trapped in “pitfalls” similar to the one which David Douglass lost his life on the slopes of **Mauna Kea** in 1834. I have heard old Kamaainas tell of the vast herds of these wild animals that were once so plentiful and of how they used to rope and shoot them not so many years ago.

*Within my time however wild cattle have never been plentiful. The last of them were killed on the upper slopes of **Mauna Kea** about six or eight years ago. There yet remains a few head on the lower slopes within the heavy rain forest. Here they live under such wet conditions under foot that their toes grow long and they leave behind them a foot print that gives the impression that some animal of about the size and weight of an elephant has passed that way. They are hard to get at and success usually depends upon chance and good dogs.*

The last real stand of wild cattle is being made on the southeast slopes of Mauna Loa above the 5,000 foot contour. In this almost inaccessible section, small bands of these animals can still be found and offer thrilling sport to the hunter with either rope or gun. The “Long-horns” of the early Mexican cattle have gradually disappeared until today there are none to be found except as mounted trophies of the past. The present strain of wild cattle is a mixture of practically all the breeds ever introduced here and the result is often a queer looking animal. The Bulls are usually Red or Black and apparently have good blood for they are big fellows and offer plenty of fight when cornered or wounded. Except in dry weather, these animals are usually in good condition and the meat is well worth packing out.

In hunting them it is necessary to stalk them with considerable care and silence. They are easily alarmed and are off at the first sign of danger. They live in a rough, lava strewn area, over which a horse or man makes slow progress and once they start to run it is difficult to catch them even with dogs. We find that a 30-30 is a little too light for these animals particularly the bulls which are very hard to kill. I recall hitting a full grown bull between the eyes with a 30-30, hi-speed bullet and afterward (when he was dead from other shots), picking it out of the hair on his forehead where it had lodged without penetrating his thick skull. I prefer a 45-70 and one of our rangers uses a .405 that kicks like a mule every time it is fired. However these heavy [page 9] guns are very effective and will usually stop an animal even though it is not hit in a vital spot. Recently we were

on the trail of a band of these animals and suddenly came upon them resting in a small “*Kipuka*” under some large *Koa* trees. One fine cow was laying down and apparently did not see us. However a big black bull, who was on watch, must have seen or heard us for he became suspicious and just as the gun was fired the cow arose and the whole band, of eight animals, were off on the run. A second shot failed to stop any of them and we thought that they were gone for good when one of the boys noticed blood on the ground at the spot where the cow had been lying and so we knew that the first shot had found its mark. To follow the track was not hard and within a quarter of a mile we found the wounded animal hiding in a dense thicket of ferns. Fortunately we had approached with caution, for a wounded cow, particularly one with a young calf, is dangerous and not to be treated lightly. A third shot was a complete miss due to lack of breath from running. The fourth shot however did the trick and the animal was soon skinned and cut up and loaded on the mule and we found we had about four hundred pounds of prime beef.

It is estimated that about two hundred of these wild animals yet remain on the slopes of Mauna Loa, where they range, live and die, and seldom see man. Their days are numbered for a new forest fence, eighteen miles long, is being built along the upper boundary of the Kau Forest Reserve by the CCC boys working under the direction of the Territorial Division of Forestry. When completed this fence will aid in confining these animals and eventually they will disappear as they have from other sections of the Island. In the meantime they will furnish many a good, juicy steak and stew for the CCC boys. [page 30]

**“New Discoveries Made on Mauna Kea.**

***Big Island Volcano Site of Worlds Largest Stone Age Workshops” (1937)***

On November 6, 1937, D. Billam-Walker, a writer with the Honolulu Star-Bulletin, reported that Kenneth Emory of the Bishop Museum, had conducted an archaeological survey of the Mauna Kea Adze quarries and shrines. This being the first formal archaeological investigation on Mauna Kea. Through the article Emory provided readers with a view into the history of traditional practices on Mauna Kea. *Figure 24*, accompanied the article, and depicts one of the quarry and shrine complexes.

***Ethnologist K.P. Emory Finds Extensive Evidence While on ‘Busman’s Holiday’  
The worlds largest stone age workshops probably exist in Hawaii.***

Announcement of this discovery was made today by Kenneth P. Emory, ethnologist of the Bishop Museum, following recent studies by him at the summit region of ***Mauna Kea*** on the Big Island.

Located on the western slopes of the Pacific’s highest mountain, some 14 to 15 workshops have been found along the 12,000 foot contour and over a distance of two miles.

Each workshop is represented by a huge mound of stone chips—millions of flakings, the work of adz-makers over many generations.

In addition to the millions of chips, hundreds of adzes in the rough can be found. At one mound Mr. Emory found at least 500 roughly finished adzes. A typical mound of chips was 40 feet in diameter at the base, rising to a height of 8 or 10 feet.

“The area littered by the quarried stones,” said Mr. Emory, covers a good many acres.”

Although the existence of these mounds just below ***Lake Waiau*** has been known since the earliest times and the site visited by hundreds of persons, Mr. Emory is the first archeologist to have made a study of them.



**Figure 24. Adze Quarry on Mauna Kea (Hawaii Tourist Bureau Photo, 1937)  
(Copy Photo KPA-N614)**

“I believe these were the largest workshops in the world for making of stone tools,” said Mr. Emory today.

Coincident with Mr. Emory’s study of the workshops, he found five shrines in the vicinity of the workshops. The shrines are similar to those found on Necker Island 300 miles to the northwest of Niihau.

Following his study of the Necker shrines in 1924, Mr. Emory predicted that similar shrines should be found in Hawaii. In 1931 A.E. Husdon of the Bishop Museum staff, following a lead given him by Dr. Thomas A. Jaggar, director of the Kilauea volcano observatory, found such a shrine at the source of the Alike flow on Mauna Loa.

Dr. Jaggar had discovered and photographed this shrine in 1919 but had not means of realizing its significance.

Each shrine found on **Mauna Kea** consists of five to 15 stone uprights in alignment. The uprights are slabs of dike basalt from two to four feet high. Some of the uprights stand on stone platforms. Mr. Emory believes the shrines were those of the adze makers. He found adz chips had been built into the platforms and others laid on them as if they had been offerings.

“The shrines are basically related to the earliest form of *marae* (simple form of temple) known to have been set up by the Polynesians,” said Mr. Emory, “and doubtless are a survival into historic times of the early type of structure.”

### ***An Adzemaker's Guild***

The adzemakers, skilled artisans, perhaps formed a guild—handing knowledge of their technique from father to son and at the same time observing the rites of the ancient Hawaiian religion. Religion in Hawaii underwent a reformation with the introduction of new ideas from Tahiti about the 12<sup>th</sup> and 13<sup>th</sup> centuries A.D.

Hawaii was peopled by two distinct groups, although from the same source — Tahiti. The menehunes were the aborigines, while the *alii* represent a later invasion, introducing at the same time the comparatively elaborated *heiau* form of temple.

Finding of these shrines indicates that the adzemakers were aborigines, that they kept their religion from being absorbed into the late *alii* culture.

In connection with each workshop was found a cave. M. Emory believes the adzemakers did their work during the summer, making their homes just below the forest line at 10,000 feet, going up daily to the workshops. The caves would serve as a refuge during storms and as against the intensely cold winds likely to spring up at any moment.

The adzemakers obtained their material from great outcrops of dike basalt. Although similar quality basalt is found in many other places in the islands, no such extensive use was made anywhere else.

Frost is experienced every night at these workshops and Mr. Emory believes the Hawaiians made use of this phenomena, letting the frost do most of the work for them.

Dike basalt when touched by frost splits into slabs of just about the right thickness for adzes.

Enjoying a busman's holiday, Mr. Emory did his work on ***Mauna Kea*** during his recent vacation.

He spent about a week on the summit. With him were his wife and two nephews, Richard and William Emory; Dr. Chester K. Wentworth, board of water supply geologist; C.S. Judd Jr., son of the chief territorial forester, and Dick Stafford, son of Judge H.E. Stafford. [Honolulu Star-Bulletin, November 6, 1937:1 & Sec. 2:2]

### ***“Ski Aloha” (1937)***

***by C.H. Martin***

***Paradise of the Pacific, December 1937:7-8***

***(Assessment of Mauna Kea's Ski Slopes):***

In answer to a challenge from ***Mauna Kea***, an intrepid group of skiers and sportsmen determined last February to find out by first hand experience whether or not skiing in Hawaii could be developed into one of the major attractions of the Islands. The results exceeded the expectations of the most critical winter sportsman, and complete reports have already been submitted to the U.S Eastern Amateur Ski Association, The National Ski Association, and several others.

In order that our readers may appreciate what lied a few thousand feet above the beaten path on the Island of Hawaii, we invite your attention to the accompanying photographs which may be considered fair close-ups of ***Mauna Kea's*** well-known white crest [Figure 25]. Realizing that, until adequate transportation facilities were developed, only a fortunate few would be able to enjoy Hawaii's Winter Paradise, the party, consisting of local business and professional people, set out, not to do something spectacular, but to observe carefully and reconnoiter terrain which might well be opened to the skiing world.

The mere subject of skiing in Hawaii seems rather fantastic to many people, but to any sportsman who has observed the unprecedented spread of the party to all corners of the slope, it is not so unbelievable. Of the three major mountains in the Hawaiian Group, Haleakala on Maui, Mauna Loa and **Mauna Kea** on Hawaii, the latter seemed to be the most inviting. However, despite the fact that snow usually makes its appearance on these mountains as early as the second week in December, our party did not gather itself together until the week before February 22.



**Figure 25. L.W. Bryan, Harold Dillingham, Jr., Dudely C. Lewis and Gordon Scruton Skiing on Mauna Kea (A. Robinson, Photo; Copy Photo KPA-N839)**

Upon the arrival in Hilo of the major portion of the party, it was considered advisable to divide into two groups, each of which climbed up the sides of the mountain, thus permitting twice the area to be covered in the limited time available, and facilitating comfortable housing for each group. Those who

climbed the southern slopes were very ably led by L.W. Bryan, Associate Forester. This party consisted of his son (Jackie), two experienced skiers from Honolulu, Dudley Lewis and Harold Dillingham, Jr., George Armitage of the Hawaii Tourist Bureau and his photographer, M.A. Robinson, Charles W. Herbert, representative of the "March of Time," Gordon H. Scruton of Hilo, and several others. In anticipation of possible better skiing conditions on the northeastern slopes, the other group set out simultaneously. It consisted of Dr. Nils P. Larsen, Richard Black, field representative of the U.S. Department of Interior, Dave Larsen of the Hamakua Mill Company, Jerry Denslow, Helen Herman, Nina Cooper and Prince Ross of the Big Island, three Hawaiian cowboys—and the writer.

Mr. Lewis, in last June's issue of the "Paradise of the Pacific," described the experiences of those who skied on the southern face of **Mauna Kea**. We now welcome an opportunity to describe our experiences on the northeastern slopes, and later to elaborate on skiing in general.

According to weather reports, the year was not a good one for snow, and although we found abundant depths at elevation 11,000 feet, had we been two weeks earlier, we would have enjoyed open rolling terrain from 13,784 feet to approximately 8,800 feet—almost a mile vertical descent. Before reaching the snow line, however, it was necessary to pass through country which, until comparatively recent years, was the abode of wild cattle and horses. Beyond this, close to the timber line, we passed innumerable wild pigs, goats and sheep. Looking backwards toward the sea from above the last traces of timber we could see Haleakala rising majestically to its elevation 10,025 feet on the Island of Maui.

Once on the snow we felt all the exhilaration that [page 7] the Alps or the Canadian Rockies may give to one who skis in the Springtime. All that may be considered typically Hawaiian was lost completely in the endless rolling open slopes that stretched out before us. Of the various forms of snow one of the most delightful is known as “corn” snow, which is usually found at the end of the winter season, and normally in the higher altitudes. The particularly desirable feature of this corn snow is its ability to provide fast skiing, whether wet or dry, comparatively regardless of temperature. It was a distinct pleasure to realize that here in Hawaii we have seemingly endless miles of this type skiing.

Tremendous vertical descents can be made with no fear of running into rocks or gulches, because the normal depth of snow was found to be more than adequate for the terrain. Of the four essential elements heat, cold, rain and light, the latter gave us most concern. Temperatures were those of the Springtime in temperate climates, the rain was not at all bothersome, but the intensity of ultra-violet light at that elevation was found to be extremely high. Unusually dark glasses are necessary and faces had to be blackened, but not until several cases of herpes or lip-burn appeared did we realize that ordinary lipstick became a valuable accessory.

It was expected that much of the upper country exposed to the trade winds would be hard packed, with wind ripples that are generally unpleasant to the skier, but nowhere did we find anything but the most perfect open slopes. Unlimited possibilities exist for slalom and down hill ski races of the highest order.

For further guidance of those who may plan to visit Hawaii’s Winter Paradise, it must be mentioned that such a trip is definitely a vacation or long week-end proposition. With the limited transportation facilities available, it is impossible to enjoy skiing over the ordinary week-end. Moreover, it was definitely learned that skiing must be done in the morning since the mountains frequently cloud in at one or three o’clock in the afternoon.

Encouraged by the fact that our introductory glimpse of the snow country proved to be a wholesome success, the more enthusiastic winter sportsmen have recently formed the “Ski Club of Hawaii.” Although the Club plans are in a nebulous state, the underlying purpose of the organization is to offer assistance to the local transportation companies, the Territorial Government, and the Federal Government, in a sincere effort to develop facilities which will make one of the greatest, and one of the simplest, sports in the world a comfortable reality for many instead of a happy retreat for a few.

Surveys were made last February to aid future skiers, and next January a much larger party will attempt to explore further in the direction of the summit. Tentative plans have been made to camp in the snow at elevation 10,000 feet and, if conditions permit, a complete survey of the snow area as well as the various methods of approach, will be made. Plans are also being made for a combined slalom and downhill tournament in the vicinity of the *Humuula* Sheep Station so that the interested public may have an opportunity to observe Hawaii’s winter sports under the most favorable conditions.

If we were to judge by the overwhelming reception which was received by the eastern “Snow Trains,” the Atlantic Ski Excursions, Union Pacific developments in Sun Valley, Idaho, and even such things as the phenomenal popularity of skiing in the Atlas Mountains of Morocco, would it not be reasonable to expect within the near future Inter-Island “Snow Boats” or “Snow Planes” —a special highway to the choicest location on *Mauna Kea* or even a government subsidized chalet close to the snow line? These things seem all the more reasonable when we consider that last year the actual ski season in Hawaii was six weeks longer than that of New England.

If the winter games of the 1940 Olympiad are held in Japan, the Hawaiian Islands may, if the facilities are developed, offer considerable attraction en route to those who may travel to the Orient as spectators. Tournaments and exhibitions might easily be arranged. At the present writing we have already had two such requests.

And so, while many of our friends wait patiently for the volcano Kilauea to pour forth her warnings, an ever-increasing group of people, young and old, male and female, look forward this season to a heavy blanket of snow on **Mauna Kea** so that it too, though dead for centuries, may come to life with a new activity. [page 8]

### ***Visitor's Guide to Mauna Kea and the Mountain Lands (1937)***

William R. Castle, Jr., son of James Castle, who started a lumbering business (with the mill situated at Kapahuakea, near the Humu'ula-Pi'ihonua boundary), and bullock hunting operations on Mauna Kea and the neighboring mountain lands in the 1830s, published a book titled, "Hawaii Past and Present" (Castle, 1937). A part of the book was meant to serve as a guide to various localities of interest to visitors, and in it, Castle wrote about the ascent of Mauna Kea, and the other mountains of Hawai'i. Castle observed:

...For those able and willing to take long, rough horseback trips there are at least three excursions which are well worth while. First is the ascent of Mauna Loa. There are two old trails, one from Pahala, Kau, on the south side of the mountain, and one from Napoopoo, Kona, on the west side, but although these are both interesting excursions, the best and easiest way to go is certainly by the new trail, starting from the Volcano [page 216] House. This is a trip of about sixty miles. The first twenty miles takes one through some of the most interesting forests in the Islands, woods that contain some of the really old *koa* trees that are ten to twelve feet in diameter; the last ten miles are over rough lava flows, through a country that is superb in the desolation of its high, wind-swept places. At an altitude of nearly 14,000 feet it must be remembered that the nights are always, and the days sometimes, very cold. The sight of the great crater of Mokuaweoweo, at the summit of the mountain, is a fit reward, however, for any hardship.

The ascent of **Mauna Kea**, an excursion less often taken, is, perhaps, the finest in the Islands with the exception of the trip to the top of Haleakala. Although there has been no recent activity from **Mauna Kea**, the visible evidences of violent eruption, the yawning caverns, and the wildly fantastic lava flows are as spectacular in their way as are the fire fountains in Kilauea. The best point of departure is from the Parkers' sheep ranch, which is situated thirty-five or forty miles from Waimea on the great upland plateau between the three mountains. **Mauna Kea**, which is the highest island mountain in the world, has a summit platform five miles long and two wide, and it is the huge cinder cones on this platform, which from below look like peaks, which make this mountain [page 217] higher than its greater neighbor. On this platform, 12,000 feet above sea level, is an ancient quarry, where the natives in olden times made their stone adzes and weapons. There is also a small lake fed from the melting snows. From the Parkers' ranch it is possible to go to the top and back in one long day, and through the courtesy of the Parkers two nights may be spent at the ranch. The ascent may also be made from Mana on the northwest side, from **Keanakolu** on the north, or from Hilo on the east, where arrangements for the trip are made. Any one of these routes leads through the native forests, here quite untouched, as well as over the rocky region above the forest line, but any one takes more time than the first.

Another most interesting and almost unknown horseback trip is that from **Kalaieha** to Kilauea. This trail leads through magnificent and quite unexplored forests and across lava flows most fantastic in their formations. It takes one through some of the most beautiful country on Hawaii, through regions that are practically unknown, and where one can see

the virgin tropical forests as wild and tangled as they were before the discovery of the Islands.

These three trips, although perfectly practicable for good riders, are seldom taken by tourists, who think that when they have seen Kilauea [page 218] certainly when they have made the circuit of the Island, they have seen all that there is to be seen. Only by going off the beaten track, however, can one get a true impression of the country; only in this way an idea of the natural scenery unaffected by civilization—scenery which happens to be of supreme natural beauty. Only by taking such trips as these, moreover, can the tourist realize that Hawaii is fully in the tropics, a land of superabundant, huge-leaved, multi-coloured growth. Tourists who wish to see these things should remember that notice of at least two or three days should be given so that arrangements can be made.

Even if it had no volcanoes, Hawaii, with its magnificent mountains and its endless variety of climate and scenery, would well repay a visit of several days. It is, however, the volcanoes, and especially the great active volcano of Kilauea, which make the crossing to the Island imperative and which would make worth while a journey half-way around the world... [Castle, 1937:219]

### ***Civilian Conservation Corps in the Hawaiian Islands (1937)***

In December 1937, Everett Tillett, Field Supervisor, Emergency Conservation Work (of the National Park Service, Department of the Interior), published an article in *Paradise of the Pacific*, describing work being undertaken by the Civilian Conservation Corps (CCC) in Hawai'i. The CCC began its work in the Hawaiian Islands on April 1, 1934, under the direction of the Territorial Division of Forestry. The mountain lands on the island of Hawai'i were among the significant working fields of the CCC, with work on Mauna Kea extending from the summit to the forest lands. Fencing projects, planting trees, habitat restoration or stabilization, eradication of undesirable ungulates, and road and trail work were all programs undertaken by the CCC on Mauna Kea. In the following article, Tillett provided readers with an overview of the program:

The present authorized strength of the Civilian Conservation Corps for all the Hawaiian Islands, including the Camp in Hawaii, is eight hundred enrollees.

Work of the CCC in the Territory is meeting a real need in the form of forest conservation. Enrollees have performed a great variety of tasks since they started their work in the Islands. These include tree planting and maintenance, collection of tree seeds, fence building and maintenance, trail building and maintenance, fighting forest fires, construction of fire breaks and lanes, erosion control, and eradication of wild range animals that destroy the natural forests, and many other forms of forest conservation. This constructive work is being done on five islands—Kauai, Oahu, Molokai, Maui and Hawaii.

Since the introduction of the CCC in the Territory of Hawaii, the enrollees have planted approximately 4,595,000 trees on 12,000 acres of forest reserve land; cultivated or maintained 11,000 acres of trees where the grass and vegetation have hampered the growth of the young trees; constructed approximately 350 miles of foot, horse and truck trails; repaired over 700 miles of trails; built about 100 miles of fences to protect the forest reserves; repaired approximately 60 miles of existing fences and about 25 miles of telephone lines; created several miles of fire lanes for the protection of forests; and performed a considerable amount of other conservation work. The enrollees in the various camps have performed missions in elevations ranging from sea level to the top of **Mauna Kea** which is 13,784 feet.

Building of trails has materially assisted in the proper patrolling and protecting of the forest reserves, and planting of trees. The trails also have encouraged hunters to aid in the

elimination of wild sheep, pigs and goats. The trails are very popular with the members of the hiking clubs and other individuals who enjoy trips through mountain forests.

Our CCC enrollees may well be proud of the success of their efforts. The forests will stand as living monuments to the enrollees who planted the trees and the conservationists who conceived the plan of utilizing the unemployed to perform such useful work while providing relief to the needy. I think that it can be truthfully said that the accomplishments in the entire United States during the past four years have been far beyond the most sanguine hopes of conservation organizations.

While the enrollees have been executing the tasks described above, they have been furnished food, [page 79] clothing, quarters, medical care, educational and recreational direction, and afforded every practical assistance and encouragement to better themselves for the future.

One of the requirements is that each enrollee allot at least \$22.00 of his pay per month to a needy relative. Several enrollees have increased the amount of their allotments. It is estimated that approximately seventy-five to eighty percent of the money that is earned by the enrollees finds its way into the homes of needy relatives for the purchase of the necessities of life.

Regular enrollees receive \$30.00 per month plus food, clothing, and all the accommodations mentioned above. A certain number of the enrollees, who have proved their ability, are designated leaders or assistant leaders. The monthly pay of the leaders is \$45.00 and that of the assistant leaders \$36.00. Several enrollees, who have by their work proved themselves capable of assuming greater responsibilities, have been promoted to foremen and other positions, and receive higher pay. A large number of the enrollees, after a short term in CCC Camps, have obtained employment in the commercial world.

In the Territory of Hawaii the U.S. Army does not participate in the administration of the CCC Camps to the extent that it does on the Mainland. On the Mainland the Army is in charge of the housing, feeding, clothing, educational and recreational activities, medical care, direction of the enrollees while in camp, and the disbursing of all funds. The only participation of the Army in CCC work, in the Hawaiian Islands, is the disbursing of funds.

In reporting the above accomplishments of the CCC, due acknowledgement must be given to the many organizations and persons in the Territory cooperating in this work. To name the individuals personally would require more space than is here available. The U.S. Army, U.S. Navy, Bureau of the Budget, Territorial Board of Agriculture and Forestry, FERA and WPA, the University of Hawaii, Public Health Service, several of the ranches and plantations, and many other organizations, have cooperated splendidly with the CCC. The CCC salutes them all. [page 80]

### ***“Mauna Kea” (1938)***

***By L.W. Bryan***

***Acting Territorial Forester***

***(Paradise of the Pacific, February 1938)***

The trip to the summit of ***Mauna Kea*** is more easily made on the south slope. Starting at Kamuela, 65 miles from Hilo and 13 miles from the closest seaport, Kawaihae, it is possible to drive in a car to 8,000 feet in elevation and then walk the remaining distance of eight and a half miles to the summit.

Leaving Kamuela the prospective mountain climber follows the main road towards Kona for a distance of about 5 miles to the old Keamuku Prison Camp. Here the road branches off to the left and goes through several of Parker Ranch Paddocks past Waikii. From here the road leads the hiker up the side of the mountain, past the CCC camp at **Pohakuloa**, then through **Humuula** Sheep Station (**Kalaieha**), towards **Puu Oo**. About one and a half miles past the **Humuula** Sheep Station the road again branches off to the left where it turns and goes up the mountain to **Hookomo**. The distance from Kamuela to **Hookomo** is approximately 36 miles and as the road is rough it requires about two and a half hours running time. The grade is steep in sections so ample gas, oil and water should be secured at Kamuela. Water can be had at Waikii, **Pohakuloa**, and **Humuula** but there is no chance to secure either gasoline or oil after one leaves Kamuela. After the main road is left behind, the secondary road passes through Parker Ranch and Forest Reserve lands. A large part of the road is the private property of the Parker Ranch and care should be taken not to damage any of the ranch property.

There are 17 gates to open and close on the way up and the same number on the return trip and it is important that they all be closed and hooked.

No hunting is allowed on either Parker Ranch or Government lands without permission first being obtained.

At **Hookomo** there is a small Ranger Station where water can be obtained. This station is always locked except when a Forest Ranger is present. It is never open for use of the general public. Cars can be taken a short distance beyond this station, as far as the forest gate, where the road ends and hiking begins. From this point to the top of the mountain is only eight and a half miles but it is all up hill and it usually takes the average hiker about four hours to reach the summit.

At 9,500 feet, timber line, there is a small stone house (**Halepohaku**), 16 x 20 feet, equipped with a large stove and a 2,000 gallon water tank. This house is always open and is for use of the general public. Aside from a stove, a table and benches, this building is unfurnished. Firewood is plentiful and wood from dead trees may be taken, but the cutting of live trees is prohibited. **Halepohaku** is only two miles from where the car is left and makes an excellent stopping place for the night. From this station to Lake **Waiau** is only five and a half miles with the summit about one mile beyond the Lake.

*Lake Waiau is a small body of water located at 13,000 feet. It is less than an acre in size and about eight feet deep. While the lake contains many algae they are not harmful and the water is good to drink. There is very little vegetation at this elevation and all fuel must be carried up from below. The Lake freezes over with a heavy cover of ice during the winter months and even during the summer a thin film of ice forms most every night. During the cold months of the year the ice will hold considerable weight and it is possible to enjoy "ice skating" even in Hawaii.*

*The trail from **Hookomo** to the summit is well marked and clearly defined with small "Ahus" or piles of stone placed at frequent intervals. At 12,250 feet the trail passes close to **Keanakakoi**, the old Adz Quarries of the ancient Hawaiians. Here the natives spent considerable time in years past getting a particularly hard stone for their Adz and other stone implements. It becomes quite cold at this elevation and of course water freezes quite readily. It may be that these natives had discovered the powerful force exerted by freezing water and that they made use of this force, in their work of breaking off slabs of blue rock, seems possible. The fact that they were limited in their selection of clothing makes one wonder how they ever were able to live at this high elevation. Times have changed however and heavy winter clothing should be worn on a trip to this mountain.*

**Mauna Kea** (White Mountain), is called the highest island mountain in the world. It is 13,784 feet above sea level being slightly higher than its 13,680 feet neighbor, Mauna Loa. The entire top of the mountain from about 7,500 elevation up is within the **Mauna Kea** Forest Reserve which is one of the largest forest reserves in the Territory having an area of 88,000 acres. This reserve is under the control of the Territorial Division of Forestry and is not to be confused with the Hawaii National Park which is charged with the administration of a part of the adjacent mountain of Mauna Loa. Forest Ranger Duke Kawai, is in charge of this section of the reserve area, with headquarters at Kamuela and any information required can be secured through him or from the office of the Division of Forestry in Hilo.

As the name implies, **Mauna Kea** is covered with snow during the winter months, and even during the summer it is usually possible to find small patches of snow on the north slope where the sun has not reached it.

*During the recent years skiing has been taken up in a serious way by the followers of this sport. Experts who have tried it, pronounce the skiing on this mountain equal to that of other sections of the world.*

*Two Ski Clubs have been formed, one on the Island of Hawaii and one on the Island of Oahu. It is expected [page 10] there will be large turn-out of members this winter. Situated as Hawaii is at the Crossroads of the Pacific, it is quite possible that **Mauna Kea** may someday become a central meeting place where ski enthusiasts from both hemispheres may gather in competition. Practically any degree of slope may be had for the mountain is covered with large and small cinder cones that rise up sharply to a height of 500 feet above the plain of the surrounding slope. For beginners there are more gradual slopes and even practically level areas to practice on.*

The first snow usually falls about November and comes down on the mountain to about the 11,000 foot contour and can readily be reached in a few hours by skiing enthusiasts.

Occasionally it comes down considerably lower, as it did in 1936 when it was possible to enjoy winter sports at 8,000 feet near **Hookomo**, where the cars are usually left.

Even during the winter months the sun is quite strong, and its reflection from the snow is very hard on the eyes. Last year there were a number of cases of snow-blindness. Dark glasses should be worn at all times and a heavy coating of anti-burn preparation should be applied to the face and lips to prevent burn and subsequent peeling and cracking.

*The ease with which it is now possible to ascend this mountain has been made possible by the road and trail building activities of the CCC boys and much credit is due to the organization of the secondary road and trail which they have constructed from Waiki [Waikii] to **Hookomo** and on to the summit. Due to their efforts **Mauna Kea** has become accessible and during the past two years had been visited by thousands of people. Last winter it was not uncommon for over one hundred people to climb up to the snow line and beyond in a single day. As time goes on it is hoped that the road will be continued so that cars may be taken up to the Rest House at **Halepohaku**. [Paradise of the Pacific, February 1938:38]*

**“Maui ‘Silversword’ for Big Island” (1938)**  
**(Haleakala Silverswords planted on Mauna Kea)**  
**Paradise of the Pacific, March 1938:32**

“The Silverswords and their relatives are for the most part native in the high mountains of Hawaii,” explained Dr. David D. Keck of the Carnegie Institute, last year. “It is an Alpine

plant in a tropical land, for it is confined to the slopes above 7,000 feet on Mauna Loa, **Mauna Kea** and Hualalai, on the Island of Hawaii, and to Haleakala, on Maui, the four highest peaks in the Islands.” Among “plants with popular interest, the Hawaiian Silversword is one of the world’s rarest species. On none of the four peaks is it abundant.”

“Although this Island has a silversword of its own, and a few varieties of it are found in inaccessible regions where the wild goats can’t get at it,” explained Acting Territorial Forester L.W. Bryan, on the Island of Hawaii, late last November, “the plant does now have the striking of the Maui one. Here it is dwarfed and lusterless.” The silversword seed from Haleakala has germinated successfully in our nursery and we have planted it in various places on the Island.” *Silversword plants from Maui’s Haleakala are doing well on Mauna Kea at the 8,000 foot elevation. They have been fenced off to protect them from wild sheep and goats.* [Paradise of the Pacific, 1938:32]

### “The Adz Makers of Mauna Kea” (1938)

By **Kenneth P. Emory**

*(Paradise of the Pacific, April 1938)*

In the bare and silent regions where **Mauna Kea** rises above the trade-wind clouds, thick ledges of compact basalt, warmed through the day by their southern exposure, follow the 12,500-foot contour for several miles. Before canvas sails formed white puffs on the sea far below, bringing to these shores the iron which took the place of the hard stone of the Hawaiian cutting tools, a maker of stone adzes wandering into this region must have been driven by the penetrating wind to seek shelter under the ledges. Here he would have found natural caves large enough to shelter himself and several companions. Building a wall to deflect the wind, he would have observed that the loose stones which lay about in such abundance were mostly in thin pieces such as he had sought far and wide when he had occasion to replace a broken adz or make a new one for exchange purposes. From the time of their discovery until the coming of the white man these ledges of compact basalt on **Mauna Kea**, shedding under the action of nightly frost an excellent grade of fine-grained basalt in a most convenient form for working, drew adz makers into this solitude. The number of generations this went on can only be guessed by the immense quantity of chipped stone.

When the air is clear and still at this altitude, words spoken in an ordinary tone are audible for several hundred yards. How the air must have rung with the blows of the hammer stones and the clink of broken pieces of bell-like rock sliding down the talus slopes of flakes! A person passing by on an August day in the year 1750 would probably have heard halloing across from one work shop to another and, if he had come close enough, the banter and laughter with which the Hawaiians made light any tedious task.

*Visiting this region in the summer of 1937, we located seven caves, and seven shelters formed by the overhanging of bluffs and protected from the wind by stone walls erected by the ancient Hawaiians. Here the adz makers turned out adzes in the rough, that is, finished except for grinding and polishing. Alongside the present main trail from **Humuula** to the summit cones is located the most important of the work shops known as **Ke-ana-ka-ko’i** (The cave of the adzes). The chips and unfinished adzes at this site cover an area of roughly fifty feet long by twenty feet broad, and the thickest part of the pile rises approximately ten feet above the sloping ground. Some of the other piles are nearly as large. Nowhere else in Polynesia are there such accumulations of chips and rejects. So far as I am aware, these are the largest, so far recorded, anywhere in the world. Several hundred nearly finished adzes ranging from two to twelve inches in length, and a few chisels, lay on the pile of chips at **Ke-ana-ka-ko’i** site. The ordinary discoidal hammer-stones, which we saw scattered about, were not more numerous than spherical stones of the same vesicular basalt, flattened slightly on one side. These spherical stones puzzled*

us until we discovered that a number of the rejected adzes had been smoothed and shaped by pecking so as to be gripped comfortably in the hand. We figured that these shaped rejects must have been gripped in the left hand like a stone chisel, one end placed on a stone block to be chipped, and the other end struck a smart blow with the flat face of the spherical stone mallet held in the right hand. Such a [page 21] method has not before been described but no other has been suggested which would explain these two tools certainly employed in the manufacture of the adzes. The use of the mallet-stone and of the chisel-stone, would be effective in the first rough chipping of a large block, but the discoidal hammer-stone would be necessary for the final chipping.

Large slabs and blocks of stone had been carried to the work shops from the quarries nearby. The quarries are simply places along the ledges of hard rock where quantities of slabs have been broken off by the scraping of the glacier which once covered **Mauna Kea** and by the freezing of water penetrating into cracks. There is evidence that the Hawaiians broke some of the stone from the bluffs themselves but generally they simply broke loose slabs into pieces to be carried to the work shops. Acres of ground are strewn with the dark blue, freshly broken rock contrasting with the dull grown surface of the weathered stone. In many places, the rock of the ledges is quite reddish, owing to the oxidation of its iron minerals, and this has led to the supposition that the Hawaiian built fires against the bluffs to split off the stone. But this redness is equally marked on inaccessible parts of the ledges, and is therefore due to weathering.

The floors of the caves and shelters contain grass-padding and some fragments of sea shells, but no accumulation of shells or bones such as would indicate use as living quarters. On calm nights the temperature drops well below freezing. On rainy and windy nights, water drips through the roofs of the caves. During the winter months, snow frequently covers the ground, and the bitterly cold winds sweeping over the work shops would be unendurable to the workers. In two hours of easy walking one may reach the work shops from timber line. So, it is my conclusion that the adz makers lived at warmer altitudes, walking daily to their work during favorable weather in the summer months.

In the immediate vicinity of the work shops and quarries we discovered shrines consisting of single upright stones, and lines of upright stones planted in a low platform. Dr. T. A. Jaggar, in 1919, photographed on the west slope of Mauna Loa, an alignment of upright stones, which he called Umi's altar, near the head of the Alika lava flow, at 7,800 feet elevation. Such structures have much in common with the prehistoric altars, or shrines, of lonely Necker Island, about three hundred miles northwest of Kauai, and belong to the earliest type of sacred structure in the Tahitian region of Polynesia from which we are quite sure the Hawaiians came. The adz makers, clinging to the ancient form of shrine at which to approach their patron gods, have preserved a most important link with their ancestral home. Each upright stone at a shrine probably stood for a separate god. The Hawaiian dictionary describes, 'eho as "a collection of stone gods" and this is the term which the Tuamotuans, the neighbors of the Tahitians, used to designate the alignment of upright stones on the low and narrow platform at their maraes, or sacred places.

The shrines at the adz quarries of **Mauna Kea** indicate that the work carried on here was in the hands of a group of skilled adz makers. They were able to create a stone-tool industry on a scale unequalled in the stone-age because of the superior social organization of the Hawaiian people. [page 22]

***“CCC on Island of Hawaii” (1938)***

***By L.W. Bryan, Acting Territorial Forester  
(Paradise of the Pacific, May 1938)***

*On April 1, 1933, the Civilian Conservation Corps was first started but it was not until one year later, April 1, 1934, that the first units of this Corps began work here in Hawaii under the direction of the Territorial Division of Forestry.*

We started, on the Island of Hawaii, with a total of 57 enrollees who lived at home and did work in the forest reserves in different sections of the island. This number was later on increased to 123 men all working out from their homes for it was not until June of 1935 that our first camp was opened with a total enrollment of 250 boys. This number was increased later on to 285 boys which, with the men working from homes, gave us a total enrollment of 408. This is the largest number we have had at any one time. Two years ago we were instructed to reduce our force to its present strength of 210.

During the four years, since the CCC began on Hawaii, we have enrolled a total of 920 boys and in addition we have employed 41 skilled workmen and 65 supervisory and facilitating personnel; thus making a total of 1026 persons who have been given employment and paid out of Conservation funds.

During this same period we have operated our cars for a total of 727,000 miles using 168,000 gallons of gasoline for same. In round numbers the Federal Government has spent a grand total of \$800,000.00 on this Island most of which has been in the form of salaries and wages. Each boy is obliged to make an allotment of at least \$22.50 of his monthly wage of \$30.00 to some dependent relative so it is easy to see that the money paid out is well spread around and reaches a large number of needy people.

In addition to the good done to the youth of this Island through giving them an opportunity to earn money we have tried to teach them to live together, to work, to learn some useful trade, to continue their education, to improve their health and to become better citizens. We feel that a large number of these boys have left our camps in a much better condition to go out in the world and earn their living and be better citizens. This, we feel, has been a worth-while accomplishment.

The work projects undertaken by the boys in our camps (of which we have had a total of 23), have been all along conservational lines, projects that will prove of lasting benefit to this Island in particular and to the Territory as a whole. Our entire program has been laid out and carried through with the idea in mind of increasing the usefulness of our forest reserves. The following shows just what has been accomplished along these lines during the past four years:

Tree planting, 5,296 acres, 45,438 m.d.; planting, maintenance, 7,771 acres, 26,258 m.d.; truck trails, construction, 90 miles, 26,248 m.d.; truck trails, maintenance, 81 miles, 3,326 m.d.; horse trails, construction, 159 miles, 11,550 m.d.; horse trails, maintenance, 105 miles, 2,279 m.d.; fences, construction, 82 miles, 28,615 m.d.; telephone lines, construction, 42 miles, 2,487 m.d.; firebreaks, construction, 8 miles, 1,140 m.d.; firebreaks, maintenance, 30 miles, 1,373 m.d.; minor roads, construction, 1 mile, 75 m.d.; foot trail, construction, 0.1 mile, 102 m.d.; tree seed collection, 2,873 pounds, 1,475 m.d.; eradication of exotic plants, 8 acres, 372 m.d.; elimination of wild animals, 22,814 animals, 3,699 m.d.; shelters, construction, 11 each, 1,254 m.d.; fire fighting, 217 m.d.; nurseries, produced and shipped, 2,777,496 trees, 11,837 m.d.; a total of 167,745 m.d. [page 16]

**“Ka Pua Mamane” (1938)**

***Ka Hoku o Hawaii (November 23, 1938)***

Many years have passed by since we have published anything about the flowers from the trees of Hawaii, that grow on the mountains of **Mauna Kea** and Mauna Loa, and this is perhaps the first year in which this type of flower is made known.

As a result of the setting of forests under protection by the government, people have a desire to know about the various trees and birds of Hawaii. Thus, we speak of this tree which grows here. It is the *Mamane* tree. Its trunk is rather short, and does not grow tall like the *koa* trees, but it has a very hard wood. Its flower is yellow, and when it blooms, everything around it appears yellow to the sight. This was recalled in ancient times by certain *mele* (chants) about these blossoms. There are two lines of a *mele* recalled the author, from his childhood, they are:

*Aia i ka lai o Keanakolu,  
Kuu lei mamane lu‘a i ke anu.*

There in the calm of Keanakolu,  
Is my garland of *mamane* blossoms  
that droop in the cold.

The generation of these days, perhaps does not know the types of Hawaiian trees, and they do not know of their blossoms. Those people who travel from the volcano, ascending Mauna Loa, will see this type of flower, for it is blooming, and yellow as one sees it. [Maly, translator]

**“Lake Waiau of Hawaii” (1939) [Figure 26]**

***By L. Bryan, Associate Forester***

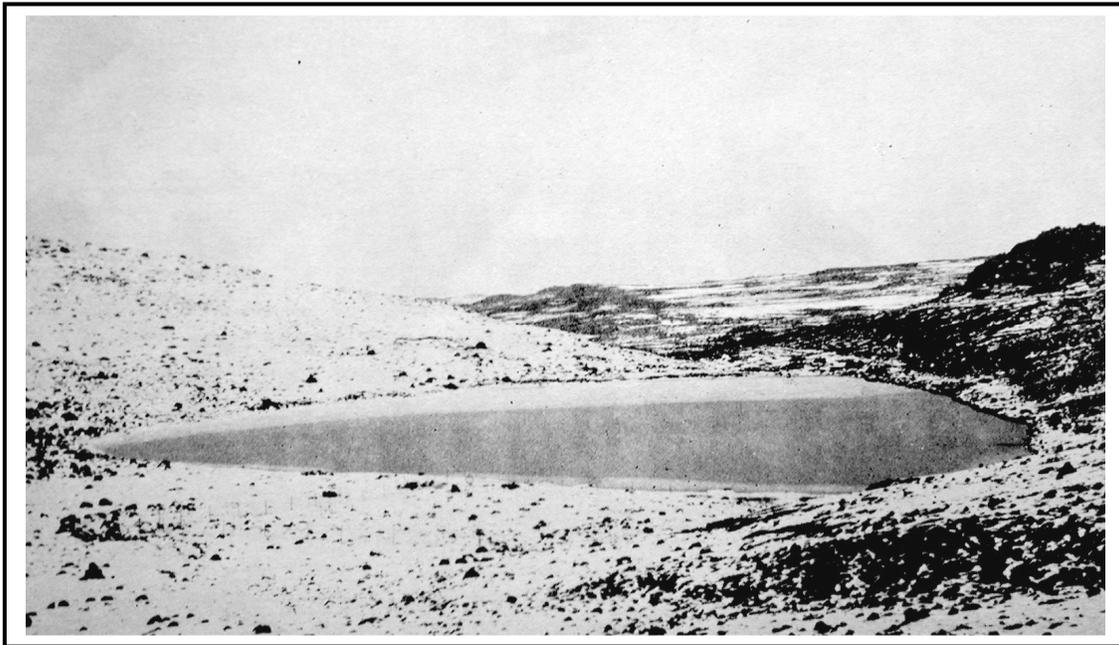
***Paradise of the Pacific, February 1939***

Lake **Waiau**, located at 13,000 feet on **Mauna Kea**, is perhaps one of the highest lakes in the world. It is located not far from the summit peak of the world’s highest Island Mountain, the top of which is 13,784 feet above sea level. The name “**Waiau**” has several meanings, for example, “water to swim in.” However, it is questionable whether much use was ever made of this water for swimming or whether this exact meaning was intended by the Hawaiians when they named it. It could mean, “the place of the water.”

**Lake Waiau** is a small body of water, about one acre in extent, and about eight to ten feet deep. In times of freshets and high water it overflows to the south and escapes down the slopes, finding its way through a series of springs into the **Pohakuloa** Gulch. These springs, several in number, occur on the south slopes of the mountain above timber line at near 11,000 feet. Part of their supply of water probably is taken from this lake through underground channels. These springs have never been known to go dry and furnish a continuous supply of pure water to the **Pohakuloa** CCC Camp. The lake contains a large number of Algae, which give it a “greenish” color. However, this plant life is not harmful and the water can readily be used by man or beast.

During the winter months the lake is usually covered with ice and frequently with snow. Even during the summer months a thin film of ice usually forms during the night but disappears when the sun comes up. In the winter the ice is often thick enough to hold the weight of several people and it is possible to enjoy ice skating thereon.

During the past few years this lake has been visited by increasingly large numbers of visitors. Three years ago the Civilian Conservation Corps reconstructed an old trail from near the **Humuula** Sheep Station (**Kalaieha**), past **Hookomo** and **Halepohaku** to **Lake Waiau** and thence to the summit. This trail is well made and carefully marked on the ground with Ahus or piles of stones and the trip to the lake and on to the summit can easily be made by strangers without the assistance of a guide. The distance is not great,



**Figure 26. Photo of Lake Waiau, 13,000 Feet, Mauna Kea, Island of Hawaii (Copy Photo, KPA-N868)**

for most automobiles can be driven to the forest fence above **Hookomo**. From the point to the rest house at **Halepohaku** it is only two miles and from there to the lake an additional five miles, making a total distance of seven miles to hike, from the point where the cars are usually left, to the shores of the lake.

Visitors usually remain overnight at **Halepohaku**. This, as the name implies, is a “Stone House” which was constructed by the CCC about three years ago. It consists of a 10 x 20 stone house with water tank attached. Inside is a large stove, table and benches. The stove has a firebox three by five feet so that even on very cold nights this building is quite comfortable with a fire going. This station is open for the use of anyone making the trip and there is ample dry wood in this section to furnish fuel. From here to the lake and return by way of the summit is an easy day’s hike and one well worth taking.

Just before reaching the lake the trail passes by a number of the “Stone Adz Quarries” of the ancient Hawaiians. Here can be seen large piles of stone chips greatly resembling old “stone crusher” sites. The stone in this section is very hard and apparently made excellent stone implements. Just how the native Hawaiians withstood the intense cold while working and living there is somewhat of a mystery. How they kept warm, particularly at night, without modern clothing, is something yet to be solved. [page 11]

**“Vegetation of Lake Waiau, Hawaii” (1939)**

**By Marie C. Neal**

**Paradise of the Pacific, October 1939**

Remarkable for being the highest body of water in the Pacific, Lake **Waiau**, near the summit of **Mauna Kea**, was a center of interest for an expedition during an eleven-day encampment on its shore in August 1935. Located at an altitude of 13,000 feet, it is always there, in warm seasons mirroring the sky, in cold seasons covered with ice and snow. One is puzzled when standing on the rim of **Waiau** Crater and looking down at Lake **Waiau** filling its bottom to see so large a body of water, one and a half acres in expanse, in that dry, barren waste of rocks and cinders. The black cinder bowl holding it looks 100 per cent porous; but, to repeat, the lake is always there. At the time of the

expedition the water was fifteen feet deep at its deepest point, and it was probably then at its low-water stage. The weather man of the expedition found that during the eleven days the temperature of the air ranged from 57 degrees to 19 degrees. Every morning around the lake's margin we found a thin layer of ice, which melted during the day.

We wanted to see what plants if any grew on the lake's damp beach. There certainly were no plants on the dry slopes of the crater above, and very few over the whole mountain top. *Careful examination revealed hardly any vegetation near the lake and that mostly weeds: two kinds of chickweed, two kinds of grass, one thistle plant, a few plants of fleabane and dandelion; also a kind of fern, said to have world-wide distribution, and growing at higher and lower altitudes on **Mauna Kea**. The weeds may have grown from seeds brought from time to time in feed for pack animals. A few mosses and lichens also found there may be native to Hawaii. Near the lake a fenced area about forty paces square showed what might result by protection from wild and tame grazing animals. It enclosed approximately 800 plants, mostly chickweed, grasses, dandelion, and sorrel. Three tiny planted pine trees were merely existing.*<sup>30</sup>

We wanted to know, too, what plants were growing in the water. *In August 1935 the lake was muddy and greenish-yellow, as it probably is at other times. Submerged and floating in shallow water near the margin, especially on the north side, were luxuriant masses of threadlike, green-colored algae. We took samples of these by spreading them on paper and allowing them to dry in the air. To find out what was in the water, we dredged the lake with a scoop net, and after filtering out the water, placed the muddy residue in bottles to be examined later.*

Analysis of these collections made clear the reason for the muddy appearance of the water. Besides enormous quantities of a few kinds of minute animals, including a crustacean, a few kinds of microscopic plants were found. Not only the living organic matter but also the accumulation of debris resulting from the succession of generation by generation clouds the water of the lake. All plants identified are widely distributed over the world.

Bacteria were abundantly represented and were one of the chief causes of turbidity. Blue-green algae were found to have made up much of the green-colored marginal mass, where the water froze and thawed every day, and one of the simplest forms present was a rounded colony of several football-shaped cells held together by gelatin. Magnified 600 times, one colony would measure about half an inch in diameter. Mixed with it were three species of another genus of blue-green algae, all three of which grow in unbranched threads of single rows of cells covered with a thin layer of mucilage. Mixed with them was a slightly larger blue-green alga, differing from them in having its cells not so closely joined, resulting in a beaded appearance.

In the bottles containing dredged matter were some diatoms, that curious group of one-celled plants of world-wide range, estimated to include about 10,000 species. Though single plants are microscopic, they are easily [page 7, continued on page 32] visible to the naked eye when grouped in uncountable numbers in chains or in gelatinous colonies, and they are so abundant in spots on the surface of the ocean as to supply food for whales. They have a two-valved siliceous shell, like a box with a cover.

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<sup>30</sup> In 1940, Neal and Hartt, expanded upon their discussion of plants found around Lake Waiau, observing:

"More species of plants were found in Waiau Crater than elsewhere in the summit area, probably because that is the chief destination of pack animals and because of the moisture from melting snow." (Hartt and Neal, Ecology, Vol. 21, No. 2; April 1940:237-266)

Another microscopic single-celled alga collected with the blue-greens was a so-called desmid, which also has a box-and-cover shell, but which differs from diatoms in enclosing a green body.

Three different kinds of green algae, all microscopic, were identified in the green mass fringing the shore of the lake, one kind consisting of a single cell with two hair-like processes, by means of which it swims actively in water like an animal later, perhaps, dropping the hairs and becoming quiet. It is called "rain alga," and is related to the "red snow" of Polar regions. Dredged with the diatoms was an immobile green alga growing in colonies of two to eight cells bearing large or small hornlike processes. The third kind of green alga was a long unbranched thread made up of a single row of cells.

One fungus, called a water mold, was growing on the dead crustaceans. Compared with the algae collected, the mold is a large plant, one species growing as long as one-seventh of an inch. It has no green color, and so being unable to manufacture its own food, it depends on dead or living organisms for sustenance, by means of threadlike branched processes inserted in the host. This mold and related ones are found in many parts of the world living on dead insects and sick fish, as well as on dead crustaceans. [page 32]

***"Suncups in Hawaiian Snowbanks" (1939)  
by Chester K. Wentworth [Figure 27]  
Paradise of the Pacific, December 1939***

"To sit on a tropic beach, and gaze on a snow-clad mountain," as someone phrased it, is a fairly common experience for visitors on the Island of Hawaii, and to see and to feel the gleaming white snow fields of **Mauna Kea** is the good fortune of an increasing number of ski enthusiasts who visit the summit area in proper season. But still more rare is a view of the astonishing suncups and sunpeaks which occasionally form by evaporation of the snow in the dry air of that polar desert. Since many of the visitors to the summit area indulge in tobogganing or skiing, hardly possible on a suncupped surface, it must be assumed that a good job of suncupping is done only rarely. All the more luck in chancing on superb suncupping of the remnant snowbanks as did the writer on July 24, 1939, while engaged in geologic studies as a member of the Northwestern University **Mauna Kea** expedition.

***Figure 27.  
Suncups and Sunpeaks; C. Wentworth photo  
(1939); (Copy Photo KPA-N 887)***



These deep pits on the soires which stand between them were arranged in striking rows, oriented east to west, in the path of the sun, as shown in the pictures, and were from two to four feet high. They are here almost exactly vertical when formed late in July, but in higher latitudes, up to about forty degrees, they lean with the angle of the sun toward the equator, southward in the northern hemisphere and northward in the southern. They are formed chiefly at high elevations where solar heating is strong, where the air is dry, and where the temperature rises little, if any, above freezing at the time. In most temperate areas of human settlement such forms are comparatively rare though occasionally seen. The suncups have been seen as much as fifteen to eighteen feet deep on high mountains in the Andes, and are known on high mountains in low latitudes in Africa...

Because of the lack of melt water, the lack of means of escape from the bottoms of the pits, and the sub-freezing temperatures during much of the time when they are formed, all observers agree that the suncups are chiefly formed by evaporation of the snow. The constancy of their position and orientation in spite of differences of [page 47] steepness and direction of slope on which they stand is most striking, and clearly due to the orderly march of sun from east to west. It so happens, too, that the pits and spires seen by the writer were formed when the sun was as almost precisely overhead at noon, and the day on which they were photographed was the exact day of the vertical sun for the latitude of **Mauna Kea**. No wonder the spikes stood strikingly vertical, on their narrow bases, and no wonder the rows were remarkably straight under these conditions.

Apparently, when conditions are right, only a few days are required to produce these wastage forms, since they were not noted in early and middle July by other parties going to the summit, including the writer's colleagues. Since it is perhaps only occasionally, and not necessarily every year, that these suncups and sunspires are formed to mark degree, and only by chance that any observer sees them, it will be particularly interesting and informative if others who have seen them on **Mauna Kea** or Mauna Loa, will put their impressions on record... [page 48]

### ***“Glacial Ice of Hawaii” (1941) [Figure 28]***

#### ***Paradise of the Pacific, November 1941***

The summit of **Mauna Kea**, highest point in the entire Pacific, is 13,784 feet above sea level. It is a little higher than Mauna Loa, which is 13,680 feet.

Come geologists to confirm the opinion of Daly and others that **Mauna Kea**, within the proverbial stones throw of tropical Hilo, has passed through a glaciation period. The phenomenon, if such it can be termed, is described in detail by Chester K. Wentworth and William E. Powers in their bulletin. “Multiple Glaciation of **Mauna Kea**, Hawaii,” published recently by the Geological Society of America, New York.

In their introductory remarks, the authors say: “Although the summit of **Mauna Kea** was first visited by a European in 1823, and was subsequently studied and described by numerous observers of note including geologists C. E. Dutton and C. H. Hitchcock, the former glaciation of this mountain was not recognized until 1910. Since that time the bolder moraines, striated ledges, and other unmistakable glacial features of the summit area have been observed by numerous persons, including geologists, topographers, and foresters. The first systematic account of the glacial features was presented in 1937, following an expedition in 1935 by the Hawaiian Academy of Science, but based in part on earlier studies by Gregory and Wentworth.”

The authors then describe a second investigation, extending over a period of five weeks during the summer of 1939 [the first being in 1935]. They add: “Although further details of the latest glaciation were mapped in the summit area lying mainly above 11,000 feet, most attention was given to the zone between 8,000 and 11,000 feet on the south side.” [Figure 27]

Here, they say, are abundant exposures of the older drifts interstratified with lava flows and bearing various evidences of antiquity. Here also were found two of the three deepest gulches on Mauna Loa [Mauna Kea]. They are **Waikahalulu** and **Pohakuloa**. Although only a few hundred feet deep, both exhibited excellent sections of the older drifts of interstratified lavas. A base camp was established on the south side of the mountain at **Hale Pohaku**, near the timber line at about the 9,300 foot level.



**Figure 28. Skiers on the Snow-banked Slopes of Mauna Kea (ahu in foreground, Mauna Loa in background). Arthur Robinson, Photographer (Copy Photo KPA-N869)**

From here the south, southwest and southeast slopes below 12,000 feet were carefully studied by foot traverse, and all drift areas were mapped. By use of pack train and temporary camps, the less accessible northern, [page 27] northwestern and northeastern slopes were examined, though less carefully than the south.

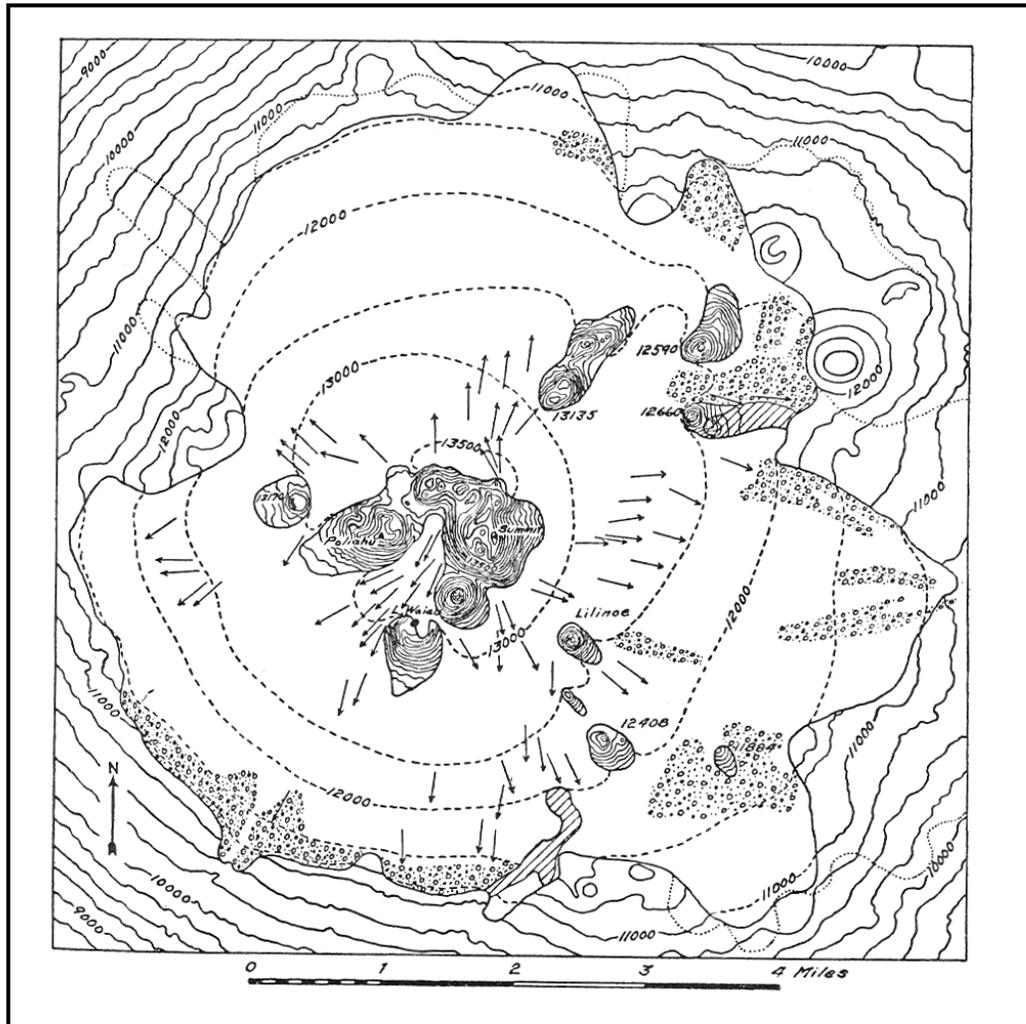
The expedition was convinced beyond doubt of glaciation evidences. The statement of the geologists continues: "The evidence. . . is widespread above 11,000 feet where there are striated and plucked ledges, rounded roches moutonnees, moraines and erratics. Glacial abrasion was generally rather feeble. In a few places the striated surfaces are sharply graved or even polished, but in the main they are only rudely grooved without conspicuous smoothing. . .

Large faceted blocks on the more recent moraines generally show only faint striations. Nevertheless, over wide areas the results of glaciation are evident in the irregular terrain strewn with angular, somewhat faceted black, gray and tan blocks of various sizes. During the latest glacial stage, designated the **Makanaka**, ice covered approximately twenty-six square miles of the summit area and its margin lay generally at 10,750 to 12,000 feet. Where retarded by cinder cones, the margin remained above 12,000 feet, but where valleys aided concentration of flow, the **Makanaka** glacier descended lower and in the Pohakuloa gulch reached about 10,200 feet. . . [Figure 29]

The geologists concluded that the maximum thickness of the ice during the **Makanaka** stage was about 350 feet, with an average of more than 150 feet . . . The form of the mountain affected glacial movement. On the summit plateau gentle slopes favored accumulation of snow and its transformation into ice, but below 11,000 feet the generally steeper slopes must have greatly facilitated spreading and dissipation of such ice from upper margins. . ."

How the glaciers played hide and seek with lava flows is hinted by the geologists. Lava

flows, they point out, have always tended to fill the radial valleys and thus heal erosional scars. This tendency of flows to follow and fill radial valleys on composite volcanic cones like **Mauna Kea** is so universal that few ravines show identical stratigraphic sections in both walls.



**Figure 29. Map of the Glaciated Area on Mauna Kea (Gregory & Wentworth, 1937:1731)**

Snow is common on **Mauna Kea** above 10,000 feet during the winter months, and occasionally occurs in summer. During winter storms the snow frequently mantles the mountain above 8,000 to 9,000 feet. In 1936 the white drift swept down to the 7,000-foot level.

“That an oceanic island lying within 20 degrees the equator could be glaciated down to the 7,000 level is extraordinary,” the authors observe. “Its implications regarding Pleistocene world climates are important.” Nevertheless, the geologists are of the opinion—in the absence of a continuous record of temperatures at the summit—that mercury registers below freezing practically every day in the year.

A side glance at Mauna Loa, twin mountain, and still active as a volcano, is interesting. The authors say, “A comparison with Mauna Loa is instructive. The latter’s fresh, almost uneroded form and immaturity of soils and forest reflect its steady upbuilding by lava

outpourings up to the present time. During the last 100 years Mauna Loa has extruded lava at the rate of 5,000 to 10,000 million cubic meters per century. That amounts to an average growth over the entire area of the dome of three to six feet per century. If this rate has been sustained for the entire period of the post glacial period of, let us say, 30,000 years. Mauna Loa must have been 1,000 to 2,000 feet lower than now at the end of the ice age, and presumably lower still during that period.” [page 28]

### **“Skiing on Snow-Capped Peak of Mauna Kea” (1948)**

#### ***Paradise of the Pacific, March 1948:4-5***

The Majestic slopes of Mauna Loa and **Mauna Kea**, volcanic mountains on the Big Island of Hawaii, are covered with snow during the winter months. **Mauna Kea**, the highest island mountain in the world (13,825 feet), this year has had snow reaching down to the 9,000 foot level. (Her record snow fall came down to the 7,500 foot level in 1936.)

Island residents and visitors climb **Mauna Kea** for the novelty of seeing snow in a sub-tropical area and to enjoy skiing and sledding. *In ancient times Hawaiian adze makers climbed the slopes to obtain a valuable hard stone for their tools. An adze-making pit, **Ka lua ka koi**, lies on top of **Mauna Kea**. Even when the trip was made in the summer months the men wore ti-leaf cloaks, or ahu ua, to keep out the chilly mountain winds. They also brought several extra pairs of ti leaf sandals to protect their feet from the sharp lava rocks on the tortuous climb to the top.*

These sandals were tied around the waist and were used as each pair wore out.

*Present-day climbers frequently find valuable relics of the adze-making era. [page 4]*

### **The Mauna Kea Hunting Program of the Territory of Hawaii (1948)**

#### ***“Hunting on the big island of Hawaii – Sheep, wild goats and pigs by thousands create hunters’ paradise”***

#### ***Paradise of the Pacific, May 1948:26-27***

The rugged slopes of **Mauna Kea**, on the “big island” of Hawaii abound in wild sheep, goats and pigs, making them a hunters’ paradise. Sheep hunters usually gather at **Pohakuloa**, the lodge maintained by the Hawaiian Board of Forestry and Agriculture. Here they spend the night under piles of blankets (because of the 6,500 foot elevation, the nights are almost always cold) and start out before sunrise for the mountain ridges.

They climb to the ten thousand foot elevation, where wild sheep and goats are in abundance. The Board of Forestry encourages hunting, as the animals have caused serious erosion by eating vegetation, and some authorities believe that the sheep and goats will never be entirely exterminated. In its desire to provide hunting facilities, the Territory maintains not only **Pohakuloa** lodge, with its bedding accommodations for fifty people, but smaller lodges at **Kemole** and **Kahinahina**. The latter is located near the headwaters of the Wailuku river.

There are twenty ranger stations located throughout the vast Hawaii Island forests, which cover an area of some six hundred thousand acres. There are more than three hundred miles of forest fences to be patrolled and maintained by the six Big Island rangers.

Three guides are stationed at **Pohakuloa** to lead organized parties into the best sheep regions. Hunting parties are expected to bring along their own food and to pay a nominal fee for sleeping facilities and guide service. [page 27]

## **MO‘OLELO ‘ĀINA: A CHRONOLOGICAL HISTORY OF LAND TENURE, ACCESS, RANCHING, LEASEHOLD INTERESTS, AND CONSERVATION ON THE ‘ĀINA MAUNA (1842-1963)**

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Land use records from Kingdom and Government collections for the lands of Humu‘ula, Ka‘ohe, and the neighboring *‘āina mauna*, date back to at least the 1840s. Early communications describe the taking of wild cattle, sheep, goats, and pigs from the region, through rights granted by, or on behalf of the King. By the 1850s, formal leases of the Crown and Government land holdings were granted to ranchers on the mountain lands—while plantation interests were granted leases, and in some instances, fee-simple interests on the lowlands.

As described in the historical journals and communications cited in this study, by the 1820s, populations of wild cattle (bullocks), sheep, goats, pigs, and dogs, increased to a point where they were causing impacts on the landscape, and at times, even harassing travelers. Between the 1830s to 1850s, the Kingdom established a program, which it managed through local agents, for taking wild cattle, sheep, and other stock from the mountain lands as needed for hides, tallow, and meat, or in payment for services rendered. Following the *Māhele ‘Āina* of 1848, which established a system of fee-simple property rights in Hawai‘i, individual *ali‘i* and the government began entering into leasehold agreements with parties for vast tracts of land throughout the islands.

While John Palmer Parker’s, Parker Ranch, is most generally associated with activities on the mountain lands, his early competition, in the name of Francis Spencer, and subsequently the Waimea Grazing and Agricultural Company, was at one time the largest lessee of Government and Crown lands around, and on Mauna Kea. As a part of his operations, Spencer’s activities included the entire mountain lands of Ka‘ohe and Humu‘ula, including the summit of Mauna Kea, and lands up to the summit of Mauna Loa. He also held leases on large tracts of the Waimea plain lands, and by the 1860s, leased the entire *‘ili* of Waikōloa (more than 90,000 acres), and a short time later, also leased the *ahupua‘a* of Pu‘u Anahulu and Pu‘u Wa‘awa‘a. During that time, Spencer had a monopoly on all sheep and wild cattle on Mauna Kea and the mountain lands, including uses of the Kalai‘eha, Laumai‘a, Keanakolu, Hānaipoe, the Pōhakuloa plateau lands, and smaller stations in between these areas. It wasn’t until 1870, that John Palmer Parker began to work his way into leasehold interests in Ka‘ohe, and not until 1914 that A.W. Carter, trustee of the Parker Ranch, secured a lease on the land of Humu‘ula, including the sheep station at Kalai‘eha, and other smaller stations.

The following section of the study provides readers with a chronological history of land use activities and leases on the *‘āina mauna* between 1842 to 1963. The records include a wide range of documents found in the collections of the Bureau of Conveyances (BoC), the Crown Lands Commission, Interior Department, Survey Division (of the Kingdom and subsequent government bodies), Land Division, Parker Ranch-Paniolo Preservation Society documents, and the Hawaii State Archives (HSA); describing the lands, permitted uses, restrictions, and later, removal of tracts of land from the leases for conservation purposes. The documentation cited in this section of the study is organized chronologically in several primary categories, including:

- I. Land Tenure and the *Māhele ‘Āina* (1842-1855).
- II. Mauna Kea and the Neighboring *‘Āina Mauna* (1790s-1890s): Traditional Customs, Practices, Resource Collection, and Land Use Described Before the Boundary Commission.
- III. Land Use and Leasehold Interests on the *‘Āina Mauna* Following the *Māhele ‘Āina* (1850-1963).
- IV. *Nā Ala Hele o ka ‘Āina Mauna* – Native Trails to Government Roads.
- V. Historical Surveys of the Lands of Humu‘ula, Ka‘ohe, and the *‘Āina Mauna*.

While a detailed collection of records is cited in the following sections, readers should note that more records exist, the review of which may answer questions about particular features, or aspects of history. Also, cross referencing the records below with those from the Kingdom and Territorial Survey records; historical journals; and oral history interviews, cited in various sections of this study, will add further details to historical background. Readers also please note that the use of bold and italics print in quoted material has been employed to draw readers attention to specific place names, and descriptions of features and land use activities.

## ***I. Land Tenure and the Māhele ‘Āina (1842-1855)***

In pre-western contact Hawai‘i, all land and natural resources were held in trust by the high chiefs (*ali‘i ‘ai ahupua‘a* or *ali‘i ‘ai moku*). The use of lands and resources were given to the *hoa‘āina* (native tenants), at the prerogative of the *ali‘i* and their representatives or land agents (*Konohiki*), who were generally lesser chiefs as well. In 1848, the Hawaiian system of land tenure was radically altered by the *Māhele ‘Āina* (Division of Lands). This change in land tenure was promoted by the missionaries, the growing Western population, and business interests in the island kingdom. Generally these individuals were hesitant to enter business deals on lease-hold lands.

In the years leading up to the *Māhele ‘Āina* the primary references to the mountain lands were in regards to the right to take cattle from the mountain, and the enforcement of a *kapu* on them. Among the earliest letters were two, dating from March 1842—

### ***Lahaina***

***March 26, 1842***

***Kamehameha III and Kekauluohi; to John Davis Kuakini:***

*... This is our communication to you. George Bush is going up to Hawaii for the purpose of taking cattle on the mountain, to the amount of three hundred. These three hundred cattle are to settle the difficulty with Bill, formerly spoken of. These are what we have given him for the settlement of that difficulty.*

*When those three hundred are taken, then the kapu shall again be put on the cattle, according to the former charge...* [HSA ID Misc. Box 141]

### ***Lahaina***

***March 26, 1842***

***Kamehameha III and Kekauluohi; to William Beckley:***

*... This is our charge to you. George Bush is going up there to take cattle to the amount of three hundreds, and when those hundreds are taken, then they are to be kapu again, according to the former charge.*

Furthermore, you are to aid George Bush by yourself and horses in all his business and necessities... [HSA ID Misc. Box 141]

In 1848, the *Māhele ‘Āina* defined the land interests of Kamehameha III (the King), the high-ranking chiefs, and the *Konohiki*. As a result of the *Māhele*, all land in the Kingdom of Hawai‘i came to be placed in one of three categories: (1) Crown Lands (for the occupant of the throne); (2) Government Lands (to support public works and government programs); and (3) *Konohiki* Lands (for the chiefs associated with the Kamehameha lineage and rise to power). Subsequently, the *hoa‘āina* (native tenants), were granted the right to claim parcels of land for their personal use from lands situated in the three categories of land listed above. The “Enabling” or “*Kuleana Act*” (formally submitted to the King in December 21, 1849, and approved on August 6, 1850) laid out the framework by which native tenants could apply for, and be granted fee-simple interest in “*Kuleana*” lands, and confirmed their rights of access to, and collection of resources necessary to their life upon the land in their given *ahupua‘a*. The Act reads:

**August 6, 1850**

An Act confirming certain resolutions of the King and Privy Council passed on the 21<sup>st</sup> day of December 1849, granting to the common people allodial titles for their own lands and house lots, and certain other privileges.

Be it enacted by the Nobles and Representatives of the People of the Hawaiian Islands in Legislative Council assembled;

That the following sections which were passed by the King in Privy Council on the 21<sup>st</sup> day of December A.D. 1849 when the Legislature was not in session, be, and are hereby confirmed, and that certain other provisions be inserted, as follows:

**Section 1.** Resolved. That fee simple titles, free of commutation, be and are hereby granted to all native tenants, who occupy and improve any portion of any *Government land*, for the land they so occupy and improve, and whose claims to said lands shall be recognized as genuine by the Land Commission; Provided, however, that the Resolution shall not extend to Konohikis or other persons having the care of Government lands or to the house lots and other lands, in which the Government have an interest, in the Districts of Honolulu, Lahaina and Hilo.

**Section 2.** By and with the consent of the King and Chiefs in Privy Council assembled, it is hereby resolved, that fee simple titles free of commutation, be and are hereby granted to all native tenants who occupy and improve any *lands other than those mentioned in the preceding Resolution, held by the King or any chief or Konohiki* for the land they so occupy and improve. Provided however, this Resolution shall not extend to house lots or other lands situated in the Districts of Honolulu, Lahaina and Hilo.

**Section 3.** Resolved that the Board of Commissioners to quiet Land titles be, and is hereby empowered to award fee simple titles in accordance with the foregoing Resolutions; *to define and separate the portions belonging to different individuals; and to provide for an equitable exchange of such different portions where it can be done, so that each man's land may be by itself.*

**Section 4.** Resolved that *a certain portion of the Government lands in each Island shall be set apart, and placed in the hands of special agents to be disposed of in lots of from one to fifty acres in fee simple to such natives as may not be otherwise furnished with sufficient lands at a minimum price of fifty cents per acre.*

**Section 5.** In granting to the People, their House lots in fee simple, such as are separate and distinct from their cultivated lands, the amount of land in each of said *House lots shall not exceed one quarter of an acre.*

**Section 6.** *In granting to the people their cultivated grounds, or Kalo lands, they shall only be entitled to what they have really cultivated, and which lie in the form of cultivated lands; and not such as the people may have cultivated in different spots, with the seeming intention of enlarging their lots; nor shall they be entitled to the waste lands.*

**Section 7.** *When the Landlords have taken allodial titles to their lands the people on each of their lands shall not be deprived of the right to take firewood, aho cord, thatch, or ti leaf from the land on which they live, for their own private use, should they need them, but they shall not have a right to take such articles to sell for profit. They shall also inform the Landlord or his agent, and proceed with his consent. The people shall also have a right to drinking water, and running water, and the right of way. The springs of water, and running water, and roads shall be free to all should they need them, on all lands granted in fee*

*simple. Provided, that this shall not be applicable to wells and water courses which individuals have made for their own use.*

Done and passed at the Council House, Honolulu this 6<sup>th</sup> day of August 1850. [copied from original hand written "Enabling Act"<sup>31</sup> – HSA, DLNR 2-4]

The lands awarded to the *hoa'āina* (native tenants) became known as "*Kuleana Lands*." All of the claims and awards (the Land Commission Awards or L.C.A.) were numbered, and the L.C.A. numbers remain in use today to identify the original owners of lands in Hawai'i.

The work of the Land Commission was brought to a close on March 31, 1855. The program, directed by principles adopted on August 20, 1846, met with mixed results. In its' statement to the King, the Commissioners to Quiet Land Titles (George M. Robertson, March 31, 1855) summarized events that had transpired during the life of the Commission:

...The first award made by the Commission was that of John Voss on the 31<sup>st</sup> March 1847.

The time originally granted to the Board for the hearing and settlement of all the land claims in the kingdom was two years, ending the fourteenth day of February, 1848.

Before the expiration of that term it became evident that a longer time would be required to perform a work... Accordingly, the Legislature on the 26<sup>th</sup> day of August 1847, passed an Act to extend the duration of the Board to the 14<sup>th</sup> of February, 1849, adding one year to the term first prescribed, not however, for the purpose of admitting fresh claims, but for the purposes of hearing, adjudicating and surveying those claims that should be presented by the 14<sup>th</sup> February, 1848. It became apparent to the Legislature of 1848 that the labors of the Land Commission had never been fully understood, nor the magnitude of the work assigned to them properly appreciated, and that it was necessary again to extend the duration of the Board. An act was accordingly passed, wisely extending the powers of the Commissioners "for such a period of time from the 14<sup>th</sup> day of February 1849, as shall be necessary for the full and faithful examination, settlement and award upon all such claims as may have been presented to said Board." ...[T]he Board appointed a number of Sub-Commissioners in various parts of the kingdom, chiefly gentlemen connected with the American Mission, who from their intelligence, knowledge of the Hawaiian language, and well-known desire to forward any work which they believed to be for the good of the people, were better calculated than any other class of men on the islands to be useful auxiliaries to the Board at Honolulu...

...During the ten months that elapsed between the constitution of the Board and the end of the year 1846, only 371 claims were received at the office; during the year 1847 only 2,460, while 8,478 came in after the first day of January 1848. To these are to be added 2,100 claims, bearing supplementary numbers, chiefly consisting of claims which had been forwarded to the Board, but lost or destroyed on the way. In the year 1851, 105 new claims were admitted, for Kuleanas in the Fort Lands of Honolulu, by order of the Legislature. The total number of claims therefore, amounts to 13,514, of which 209 belonged to foreigners and their descendants. The original papers, as they were received at the office, were numbered and copied into the Registers of the Commission, which highly necessary part of the work entailed no small amount of labor...

...The whole number of Awards perfected by the Board up to its dissolution is 9,337, leaving an apparent balance of claims not awarded of say 4,200. Of these, at least 1,500

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<sup>31</sup> See also "Kanawai Hoopai Karaima no ko Hawaii Pae Aina" (Penal Code) 1850.

may be ranked as duplicates, and of the remaining 2,700 perhaps 1,500 have been rejected as bad, while of the balance some have not been prosecuted by the parties interested; many have been relinquished and given up to the Konohikis, even after surveys were procured by the Board, and hundreds of claimants have died, leaving no legal representatives. It is probable also that on account of the dilatoriness of some claimants in prosecuting their rights before the Commission, there are even now, after the great length of time which has been afforded, some perfectly good claims on the Registers of the Board, the owners of which have never taken the trouble to prove them. If there are any such, they deserve no commiseration, for every pains has been taken by the Commissioners and their agents, by means of oft repeated public notices and renewed visits to the different districts of the Islands, to afford all and every of the claimants an opportunity of securing their rights... [Minister of Interior Report, 1856:10-17]

It is reported that the total amount of land awarded to *hoa'āina* equaled approximately 28,658 acres (cf. Kame'eleihiwa 1992:295).

### ***Disposition of Selected Lands of the 'Āina Mauna During the Māhele***

As described above, in the period leading up to the *Māhele* of 1848, all the land was held by Kamehameha III and the *ali'i* who had supported his father and he, in the formation of the kingdom. During that time the lands were held by one or more chiefs. The *Māhele 'Āina* clarified those interests, and disposition of the primary lands which rest upon the *'āina mauna* of Hawai'i, or bound Humu'ula and Ka'ohē was resolved on the following dates:

#### ***Humu'ula, Hilo***

Relinquished by Victoria Kamamalu to Kamehameha III on January 27, 1848 (*Buke Mahele*, 1848:5-6). Retained as a part of the Crown Land Inventory (*Buke Mahele*, 1848:186-187). *One native claim registered, not awarded.*

#### ***Kalōpā, Hāmākua***

Relinquished by Victoria Kamamalu to Kamehameha III on January 27, 1848 (*Buke Mahele*, 1848:5-6). Retained as a part of the Crown Land Inventory (*Buke Mahele*, 1848:190-191). *No native claims registered.*

#### ***Ka'ohē, Hāmākua***

Relinquished by Victoria Kamamalu to Kamehameha III on January 27, 1848 (*Buke Mahele*, 1848:5-6).

Given by Kamehameha III to Government Land Inventory on March 8, 1848 (*Buke Mahele*, 1848:191). *Four native claims registered, one awarded.*

#### ***Kapāpala, Ka'ū***

Relinquished by Kamakee Piikoi to Kamehameha III on January 28, 1848 (*Buke Mahele*, 1848:19-20). Retained by Kamehameha III as a part of the Crown Land Inventory (*Buke Mahele*, 1848:182). *No native claims registered.*

#### ***'Ili of Keauhou, in Kapāpala, Ka'ū***

Retained by Victoria Kamamalu on January 27, 1848 (*Buke Mahele*, 1848:5-6). *No native claims registered.*

#### ***Koholālele, Hāmākua***

Retained by Kailakanoa, on February 3, 1848 (*Buke Mahele*, 1848:81-82). *Six native claims registered, six awarded.*

***Kūka‘iau, Hāmākua***

Retained by Pehu, on January 31, 1848 (*Buke Mahele*, 1848:37-38). *Three native claims registered, two awarded.*

***Makahanaloa, Hilo***

Retained by Wm. Lunalilo, on January 28, 1848 (*Buke Mahele*, 1848:19-20). *Two native claims registered, one awarded.*

***Nanue, Hilo***

Retained by Kawai, on February 4, 1848 (*Buke Mahele*, 1848:95-96). *No native claims registered.*

***Pā‘auhau, Hāmākua***

Retained by A. Keohokalole, on January 28, 1848 (*Buke Mahele*, 1848:9-10). *No native claims registered.*

***Pāpa‘ikou, Hilo***

Retained by Kealiihonui, on February 9, 1848 (*Buke Mahele*, 1848:130-131). *Seventeen native claims registered, thirteen awarded.*

***Pi‘ihonua, Hilo***

Relinquished by Kalaeokekoi to Kamehameha III on January 28, 1848 (*Buke Mahele*, 1848:35-36). Retained as a part of the Crown Land Inventory (March 8, 1848). *Twenty native claims registered, fourteen awarded; all for lands within one mile of the shore on Hilo Bay.*

***Waiākea, Hilo***

Relinquished by Kaunuohua to Kamehameha III on February 4, 1848 (*Buke Mahele*, 1848:90-91). Retained as a part of the Crown Land Inventory (March 8, 1848). *Thirty-four native claims registered, twenty-five awarded; all within one mile of the shore on Hilo Bay.*

***The ‘ili of Waikōloa, Waimea***

Retained by G.D. Hueu, on February 12, 1848 (*Buke Mahele*, 1848:165). *No native claims registered.*

***Waipunalei, Hilo***

Retained by Poka, on February 2, 1848 (*Buke Mahele*, 1848:67-68). *No native claims registered.*

***Disposition of Livestock on the ‘Āina Mauna***

In the years leading up to, and through the *Māhele ‘Āina*, all livestock was considered the possession of the King. Following the *Māhele*, the livestock was divided between the King and the government, and individuals who were granted private interest in the same. The livestock held by private parties was required to be branded. While the policy of the Kingdom was clear in the procedure of the government, it is also recorded that individuals were also taking up illegal hunting of livestock. Among the communications documenting control over such livestock, are those below, from 1850 to 1856.

***Honolulu, Oahu***

***June 10, 1850***

***Public Notice—Charles Gordon Hopkins, Land Agent of the King:***

...Know all me by these presents, that we, the undersigned Agents of the King and the Government, hereby appoint G.D. Hueu, as Keeper of the Cattle at ***Waimea & Mauna Kea and surrounding districts***, or *wherever the cattle may roam, the cattle in the woods and the Government*; those are the ones he is to keep and run in places where the food is

good; to brand and perform other duties as are usually performed by a cattle herder, always looking after the interest of both parties; until such time as the King and Government may send for them, and to deliver the cattle only upon receipt of an order. In case any trouble should happen to the cattle, whether stolen or feloniously branded, the said G.D. Hueu is empowered to bring law suits in the courts, in the names of the persons who own the cattle. He to speak the word, and the management and other powers usually given to a cattle herder. [HSA ID Ltr. Book 2. Pt. 2]

***Honolulu, Oahu***

***June 15, 1850***

***Keoni Ana [to Wm. Beckley]:***

...With regretful feeling am I writing this letter to you.

I have to inform you that you are no longer to continue in the employ of the Government as manager of the cattle ranch.

You are therefore required to file a statement showing properties belonging to the Government and the King in your keeping.

Lapaula (Jarrett) is the new manager, to whom you will turn over everything. [HSA ID Ltr. Book 2. Pt. 2]

***Kailua, Hawaii***

***May 15, 1851***

***Isaac Y. Davis; to Keoni Ana:***

...I again ask you, and you let me know right away, so that I may be able to put more strength to the peace of the Government at ***Maunakea*** mountain, because, of the great number of people going up the mountain to chase wild pigs, and I have many times warned them about this matter. But, they have paid no attention, therefore, I have thought of asking you first, and then tighten up, I might go ahead, and they fall down. That's that, so please let me know soon what the right course is for me to do.

But, what I am sure about is this, that the wild pigs belong to the Government, and that the people have no right there, and because of having been told that this right was given to Moluhi by Z. Kaauwai, that is why I was doubtful about enforcing my rights on ***Maunakea*** on behalf of the Government, and if I should receive a letter from you or from some of you, then, those that chase wild pigs will be stung by me. I am really put out because they pretend that they too have a right in the mountain, (foolish)... [HSA ID Misc. Box 144]

***Hilo December 4, 1852***

***T. Metcalf, Superintendent of Public Works;***

***to A.G. Thurston, Interior Department Clerk***

***Reports on inspection of Government livestock in the region***

***from Waimea to Laumaia (Laumaea), Kalaieha (Lae eha), and Keamoku (Aamoku); recommending development of pens on the mountain lands.):***

...I have taken an account of stock at Waimea and it results as follows viz:

One Bull; 10 old cows; 87 young cows; 89 Heifers; 25 heifer calves; 84 oxen steers; 25 Bull calves; 43 sheep in all; 3 goats; 6 horses in all; and 32 *Bipi Kanawai*. The last being Bullocks received for fines. I did not count, not knowing the fact until after the act. was taken, but take Davis' act. for the number.



*After the decision is made, I should advise the building of pens where necessary & castrate all the males & mark the whole, and so continue to do yearly, until finally disposed of. Or otherwise sell the whole at once. One or the other plan must be accepted immediately or the wild bullocks will be of no account. I propose to go back to Waimea again and take a route through the woods from **Makahānaloa** to Maunakea in order to ascertain the practicability of making a road through the woods around the north side of the mountain to Waimea. But I am apprehensive the rains will defeat my project as it now pours down in torrents and bids fair to continue to do so for a long time.*

I have been examining the work upon the roads wherever I have been, but as this road subject belongs to my Annual Report, I will close... [HSA – Interior Department Misc. Box 145]

***Waimea Hawaii***

***November 1, 1856***

***Isaac Y. Davis, to Keoni Ana, Minister of the Interior***

***(Describes depredation of forest and grazing lands around Mauna Kea, as a result of the herds of wild sheep):***

...I now have a good time to write to you with *Aloha*, and tell you my thoughts about those things pertaining to the Nation of our King. *Aloha* is the foremost, and I dwell here with *Aloha* for all of you.

*First, let me tell you about the Sheep of the attorney, Mr. Montgomery, dwelling at Puupueo, on the Mountain. Five or perhaps six miles above the place of J.P. Parker, Esq. E. Sparke Esq., is the one who tends to said Sheep, the Land, and the houses, and many acres of land purchased by Mr. Montgomery. I do not know the number of acres of Land, but I have heard that it is Five hundred (500) Acres, that is all. But the Sheep roam all about, from one area here, to another area over there. The Sheep roam from Puupueo<sup>32</sup> to Puuhuluhulu [on the Waimea plain], and to the Gulch of **Kemole**. That is half of **Mauna Kea**, and many thousands of Acres that the Sheep roam across. The land is cut down, there is no place that anything will grow. The grasses are gone, and there is only dirt on the Land, just like Waimea, and because of this, the cattle are also no more on this section of the Mountain, having been routed from one place to another.*

As a result, I inquire of you, has this thing been agreed to by you, that the Sheep could simply roam about this place? Because I do not know, and am unaware of it, I inquire of you.

*If the Sheep are allowed to stay for long, as they presently do, all the grass and forest of the place shall be consumed. It will be an evil thing, for these Sheep have exceedingly poisonous teeth.*

*Here is what I know, the sheep were not numerous before, and there were many animals of other varieties in those 20 or more years past. There has been no evil seen upon the land as at the present time.*

Give my *Aloha* to C.T.B. Rooke, Kamaikui, and *Aloha* to all of your household as well.

I am with thanks... [HSA – Interior Department, Misc. Box 146; Maly, translator]

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<sup>32</sup> Pu'upueo is situated in Pā'auhau, above the Makahālau section of the ranch.

***The “Right” to Hunt on Mauna Kea and the Mountain Lands not Held as a Public Interest in 1861***

In 1860, a dispute regarding the hunting of wild “mountain” cattle arose between the lessee of the Crown and Government lands on Mauna Kea, and the owner of Waikōloa. This dispute focused on the “right” to hunt, and clarified the position of the Government in this matter—that no one had the right to hunt on the public lands, except for those who had acquired leasehold interests or special permission to do so. The entire case centered around Mauna Kea, and included important documentation on tenants and developments on the mountain lands. It is also reported that between 1826 to 1841, 40,000 wild cattle were taken from Mauna Kea and the surrounding mountain lands by licensed hunters, on behalf of the King. Up until that time, the cattle had become so numerous, that they overran vast tracts of land and the gardens of the native tenants (Hawaiian Reports, 1861:369).

The following excerpts are taken from the Hawaii Supreme Court, “*Hawaiian Reports, 1861*,” in the case of George Hueu Davis, the plaintiff, and owner of Waikōloa; and William L. Green, on behalf of Robert C. Janion (partner of Francis Spencer), the defendant, and lessee of the Crown and Government lands on Mauna Kea:

*...The law regulating the brands and marks of private owners, is not intended to apply to the wild herds roaming on the sides of **Maunakea**, which are universally recognized the “mountain cattle of the King and Government.*

These cattle cannot be regarded as animals *ferae naturae*, and therefore do not belong to that class recognized by the law as not being the subject of property in any person until reduced to possession by the captor.

The grantee of those unbranded mountain cattle from the Government, can not be allowed to enter upon the lands of private parties for the purpose of capturing these cattle, without the consent of the owners of such lands; nor can he convert the cattle of private owners because found *unbranded* upon lands leased by him.

The owners of private lands have no right to convert the said unbranded cattle of the King and Government because found upon their lands. [page 367]

Justice Robertson delivered the judgment of the Court as follows:

This is an action of trover, brought by the plaintiff to recover from the defendant the value of twenty-nine bullock hides, alleged to have been wrongfully taken and converted by certain agents of the defendant, at Waimea, Hawaii...

The plaintiff is the proprietor of an extensive tract of land, called the *Ahupuaa* of Waikoloa, on the north-western slope of **Maunakea**, and running down to Waimea, Island of Hawaii, where he also possesses a large herd of cattle. The *Ahupuaa* of Waikoloa adjoins, for many miles, the lands upon which run the herds of cattle, usually known as “the wild cattle of the King and Government.” The twenty-nine hides, the value of which is sued for in this action, were taken from unbranded animals, said to have been found and captured on the plaintiff’s land, and were in his possession, or in that of his servants, when taken away by the defendant’s agents.

*The defendant sets up a title to the hides in question, as agent for, and on behalf of, Mr. Robert C. Janion, who it is claimed, is the lessee of the lands of the King and Government, upon which the wild unbranded cattle run about **Maunakea**, and the grantee of the herds of cattle themselves, so that he stands not in the position of a mere wrong-doer. It is therefore necessary that the plaintiff should show something more, [page 368] to enable him to recover, than his bare possession. Accordingly he claims the general, or absolute, property in the hides, upon the following grounds, viz: first, that the animals*

having been captured upon his land, must be presumed, although unbranded, to have been his own cattle; secondly, that the wild unbranded cattle, on and about Maunakea, are animals *ferae naturae*,—not the property of any person, until he has taken them into possession, and may be lawfully captured by any person who finds them upon his own land; thirdly, that if the animals in question belonged to the herds called “the wild cattle of the King and Government,” plaintiff had the right, by custom, to capture them if found upon his own land, and to convert them to his own use.

As a matter of history, it is known to the Court that the first cattle placed upon these Islands were landed at Hawaii, in the years 1793 and 1794, by British navigator Captain Vancouver, by whom they were intended as a prospective boon to the inhabitants, and to those who should visit the Islands for purposes of trade or of refreshment. *King Kamehameha the First had, at that time, attained the ascendancy over the whole Island of Hawaii, and, at the suggestion of Vancouver, he proclaimed a strict taboo, or prohibition, against the killing of the cattle or their offspring, for a period of ten years, the cattle were numbered by thousands, and in course of time the herds over-ran a large part of the Island.*

It is in evidence before us, by the testimony of William Hughes and others, that, about the year 1826, when the late Chief Kuakini (John Adams) was Governor of Hawaii, he employed Hughes to catch and kill cattle out of the roaming herds, for the purpose of obtaining their hides and tallow, as a source of income for the Government, or rather for his late Majesty Kamehameha the Third, no Constitutional Government having been established at that time. The King subsequently engaged the late Joaquin Armas, with a small party of Californians, to prosecute the same business. Hughes estimates the number of cattle captured and killed by himself and his party at forty thousand. In the year 1841, the cattle were again placed under [page 369] *taboo*, all persons being publicly prohibited from capturing or killing them. Mr. J.P. Parker testifies that, up to that time he was the only person who had the privilege of shooting cattle on the mountain; while Mr. Haalelea, who lived with Governor Adams, mentions one or two others, who, he thinks, had a like privilege from the Governor. Dr. Judd testifies that, after the taboo of 1841, no person had the privilege of taking any of the cattle, except some foreigners who pursued the business of sawing timber in the forest, and who were permitted by the government to take cattle for food. The charge of the cattle on the mountain, after Hughes' time, was given to Mr. William Beckley, and after him to Mr. Isaac David, as son of the plaintiff, who acted as agent for the King and Government. In the year 1850, the following petition was presented to the King in Council, by the late James Young Kanehoa, viz:

Honolulu, Oahu, April 6, 1850.

His Majesty Kamehameha, in Privy Council:

Sire:—Your Majesty is most probably aware, that on the arrival of Captain Vancouver at these Island, he presented you illustrious Sire and my father some cattle, from which have propagated the numerous herd of wild cattle that now roam on the mountains of Hawaii. So long as these cattle were appropriated to your Majesty's private use, your petitioner appreciated that manner in which they were disposed of, but as they are now become a portion of public revenue, your petitioner most humbly begs that your majesty will be graciously pleased to order, that a portion of these cattle may be given men, my brother and sisters, as the heirs of John Young, the faithful companion of your Majesty's father, and as in duty bound your petitioner will ever pray. J.Y. Kanehoa.

On the 18<sup>th</sup> of April, 1850, the following resolution was passed, in Council, touching the foregoing petition, viz:

Resolved, That one thousand of the wild cattle of Hawaii be and are hereby given to the heirs of John Young, Senior, for their portion of said cattle; and that the shepherd of those cattle is hereby authorized to select and deliver to or permit said heirs to take such cattle, whenever it shall please them so to do; Provided, however, that said heirs shall take said cattle within two years from this date, without their increase. [page 370]

On the 10<sup>th</sup> of June, 1850, the following resolution was passed by the King in Council, viz:

Resolved, That the arrangement hitherto existing between his Majesty and the Government, with regard to the cattle in Waimea, Hawaii, be hereby confirmed so far as the joint ownership of said parties is concerned, and that in future the net proceeds of all said cattle be divided equally between his Majesty and the Government, and that neither party shall sell or remove any of them without the concurrence of the other party; said cattle furthermore to be left in charge of an agent to be chosen mutually by the King and the Minister of the Interior for the Government; Provided always, that it be understood the cattle running in the joint herd, but belonging to one or the other of the parties exclusively, be not affected by the resolution.

In a General Appropriation Bill of the year 1854-5, the Legislature made an appropriation of two thousand dollars, for the construction of a road from Waimea to Hilo, "to be paid out of the avails of wild cattle," to be sold for that purpose.

On the 8<sup>th</sup> day of April, 1857, the Minister of the Interior conveyed to Mr. Edward P. Adams, by an instrument in writing, "all and singular the wild cattle, to wit, bulls, oxen, cows and calves, unmarked and unbranded, now running on the Island of Hawaii, in the District of Hilo, Hamakua, and South Kohala, and on or near the mountains of **Maunakea** and **Maunaloa**," excepting so many of such cattle as had been previously sold to other parties, and then remained undelivered, "together with the privilege of pursuing, taking, driving and slaughtering the same, wherever they may be found upon lands belonging either to the King or the Government, without charge for pasturage while they pasture on the portions of the lands over which they have heretofore and now range, and with the right of entry upon the said lands, (the King's land of Puukapu excepted,) for and during the term of three years from and after the first of July next."

On the 24<sup>th</sup> of January 1858, the Minister of the Interior issued a public notification, which appeared in the Government Gazette, calling upon all parties who had purchased wild cattle of the King and Government, previous to the 1<sup>st</sup> of January, [page 371] 1857, to take and remove their cattle before the 1<sup>st</sup> day of May, 1858, and warning all other persons against taking any of the wild cattle.

*On the 16<sup>th</sup> of November, 1859, the Minister of the Interior acting on behalf of his Majesty, and of the Government, entered into a written agreement, under seal, by which he leased to Mr. Robert C. Janion, his representatives and assigns, "all that part of those lands belonging to his Majesty and to the Government, on the mountain of **Maunakea**, lying above the forest, on the Hilo side of the mountain and on the Waimea side of the mountain, above the lands of Paauhau and Waikoloa," (excepting certain lands specified in the instrument," "with the privilege of catching and killing the said wild unbranded cattle on any other lands belonging to His Majesty of to the Government in the Districts of Hilo,*

*Hamakua and South Kohala (excepting his Majesty's land of Puukapu,) for and during the term of five years from and after the first day of August, A.D. 1859..." [page 372]*

...The evidence is conclusive that the King and Government have continually asserted and maintained their exclusive ownership of these cattle, with the exception of that portion of them which was set part for the King in Council , the year 1850, as the private property of the heirs of John Young. The action of the Privy Council upon the petition of James Young Kanehoa shows clearly that at that time the Government did not regard the mountain [page375] cattle as animals *ferae naturae*, at the disposal of the captor, but as having always been the subject of property, not only in the King or Government, but in private individuals, the heirs of one of the original donees. And it is in evidence, by disinterested witnesses , that, up to within a few years back, when any of the mountain cattle happened to be penned with the cattle of private owners, during a general "drive in," they were treated as the property of the Government, and held at the disposal of its agents... [page 376]

Decision rendered March 28<sup>th</sup>, 1861 in favor of the R.C. Janion, lessee of the Government lands. [Hawaiian Reports, 1861:378]