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THE HAWAIIAN ISLANDS,

THEIR GEOGRAPHY, THEIR VOLCANOES, AND THEIR PEOPLE.

BY

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The Hawaiian Islands were discovered in the year 1542 by the Spanish navigator Juan Gaetano. Traces of this early visit may be found in a Spanish map of the sixteenth century which indicates the place of the islands, though somewhat incorrectly as to their longitude; and also in the lighter complexion and hair of some of the natives, which seem to indicate the crossing of their ancestors with European blood. Since the re-discovery of the group by Captain Cook in 1778 it has been generally known as the Sandwich Islands, a name conferred upon them by Captain Cook, in compliment to the British Lord of the Admiralty at the time. The Islanders themselves called their country *Hawaii* (Hä-vi-ē) from the name of the principal island, the *W* noting a sound more nearly akin to that of *V*. The native name is thought by Fornander to be cognate with Java, and to indicate an early residence of the race in the East Indies. From

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Hawaii comes our English-formed adjective *Hawaiian*, used to designate the group.

Where are these islands situated? Not in the South Pacific, as is thought by many who have not searched for them upon the map, but in the central Northern Pacific, close upon the tropic of Cancer, and about one-third of the distance on a great circle drawn south-westward from San Francisco to New Guinea. They are the most northerly of the dozen groups that are the habitat of the true Polynesian race. Their area is about 6,100 square miles; two-thirds of this are included in the principal island of Hawaii, which has about the same area as the State of Connecticut. Twelve islands are usually named as composing the group: four larger and four smaller, all inhabited, and four barren rocks; but besides these a string of scattered rocks and reefs extends far to the north-west of the group properly so-called. The islands occupy the segment of a circle convex towards the north-east, its chord having a length of about 400 statute miles. (Dutton.)

From San Francisco the distance to Honolulu, the capital, is about 2,100 miles; the Pacific Mail steamers make the trip in seven days, so that the islands are now within less than a fortnight's journey from the city of New York.

Except for the coral reefs that are found among them, the group is entirely of volcanic formation. The islands appear to have been thrown up in successive order from the north-west to the south-east, the most ancient of the group being Kauai, upon which volcanic action ceased many centuries ago. Upon the next large island, Oahu, the soil is usually less deep and the erosion of the craters is

not so marked. Honolulu, the capital, a beautiful town of 20,000 inhabitants, is situated upon this island of Oahu. On Maui, the next island toward the south-east, the signs of volcanic action are more recent; and here we find Haleakala, the greatest extinct crater in the world, a vast V-shaped chasm some eight miles in length and twenty-five or thirty in circuit. On this island the traces of volcanic action are comparatively recent; yet no tradition exists among the natives of any eruption.

Coming farther to the south-east, the terminal member of this chain of islands, Hawaii, has the greatest active volcanoes in the world. The summit crater, Mokuaweoweo, and the lateral crater, Kilauea, upon the flanks of the mountain, Mauna Loa, are familiar to my readers as the sources of the mighty eruptions which at varying intervals burst forth and at once devastate and create the land. Hawaii is an island still in process of formation; and Mauna Loa has made its present altitude of 13,760 feet entirely by the successive flows of enormous streams of extremely liquid lavas. The neighboring mountain, Mauna Kea, is a vast mass of long-extinct craters, of which the highest point surpasses the elevation of Mauna Loa, rising to the height of 13,953 feet; but the mass of the mountain is less than that of Mauna Loa, its base being smaller and its slopes less gentle. The island of Hawaii is built upon the ocean floor at a depth of about 18,000 feet, its submarine slopes corresponding closely to the subaerial; its mountains thus rise not far from 30,000 feet above the ocean floor. The mass of these volcanic domes is unequalled. Professor Dana estimates the bulk of Mauna Loa above the sea-level as not less than 125 times the

bulk of Vesuvius ; and owing to the immense extent of its base, its mass is greatly in excess even of the much higher volcanic cones of South America. The mass of Mount Ætna, Shasta, Ranier and Hood together, would be inferior to that of Mauna Loa, which is the largest of active volcanic mountains in the world.

The eruptions of this great mountain are unparalleled, at least in historic times, both as to duration and as to magnitude. There have been greater single catastrophes, notably that of Krakatoa in 1883, when it is estimated that a cubic mile of mountain was hurled into the air, and an air-wave caused by the convulsion, as indicated by self-registering barometers at scores of different stations, was transferred three times around the entire circumference of the earth within eleven days.

The eruptions of Kilauea and of the terminal crater of Mauna Loa, are on a not inferior scale, but their action is less catastrophic. Instead of a succession of mighty outbursts, the torrent of lava forces its way continuously through the mountain side, accompanied, indeed, by earthquakes, but earthquakes that are seldom of a destructive character ; and from its point of emergence the stream of fusion flows more or less rapidly seaward as the slope of land is less or greater. These eruptions and streams of liquid lava sometimes continue incessantly for more than a year ; that of 1855-6 lasted fifteen months, flowing over a course of fifty miles in length, and disgoring an amount of lava nearly equal to the entire bulk of Vesuvius.

The character of the lavas is complex ; they are composed of silica and alumina, with oxides and earthy bases. Silica is by far the largest constituent ; next

comes alumina. Two earths are found in these lavas, lime and magnesia; and two alkalies, soda and potash. The lavas fall naturally into two classes, in respect to their composition; in the first, or acid group, there is much silica; the second, or basic group contains more alkalies and earthy bases, and the lavas are very fusible. The lava of Kilauea is so fluid that it sticks like molasses, and even splashes like water. Many hundred square miles of the Island of Hawaii are overspread with recent lavas of this description.

The method of progression of these lava-streams is interesting and peculiar. Breaking out, as they do, at the point of least resistance in the mountain-side, often at a vast elevation above sea-level, the white-hot fusion pours down seaward at first at a tremendous rate of speed, flowing under a solidified crust or vault of partly-cooled lava like a river under ice, and sometimes at the pace of thirty miles an hour. But when the stream reaches the gentler slopes of the mountain, its speed slackens; and finally, as it spreads itself out upon the vast reaches of nearly level ground either between the mountains or toward the sea, its progress is checked, and is no longer continuous, but halting, for the stiff inclosing crust of cooled lava that encases it now opposes a check to its progress.

“The lavas below,” says that veteran observer, Titus Coan, “are sealed within a rigid crust that confines them on every side. Their onward progress is thus checked for hours or days. But as the tremendous pressure of the stream behind increases the crust is rent, and the liquid lava bursts out and gushes forward or laterally for a hundred, five hundred, or a

thousand feet or more, as the case may be. The surface of this extended mass cools and stiffens in turn, again confining the living lava. Then, with new pressure from behind, there is a fresh rupture in the confining shell.

. . . Thus overcoming all obstacles, the fusion is kept under cover, and moves forward or laterally in its own ducts for an indefinite distance." (*Life in Hawaii*, N. Y., 1882, p. 333.) It is a process which I have often watched in the uplands of Hawaii. The force is supplied from the mountain fissure, whence the ever-pouring stream of lava produces a growing pressure at every point of resistance; finally the crust breaks with a crash and roar, and a mass of red-hot lava is poured forth and rushes forward for yards or rods or furlongs. This presently forms for itself another enclosing crust, and the progress of the stream is checked again only to burst forth once more in obedience to new pressure. Thus little by little the stream gains mile after mile upon the level ground; thus its terminal point, many miles from the fountain-head, may continue to advance after the fountain has ceased to play, by means of the mere gravity of the fluid lavas in the covered ducts; and the same *vis a tergo* may even force a "belch" of lava upward and over an elevation under these strange dynamic conditions.

Of course any attempt to divert, modify or check the course of the lava streams is entirely futile. I remember that a Chinese merchant in the town of Hilo, on hearing of the approach of a lava stream from Mauna Loa, complained that the natives showed no enterprise in the management of eruptions. "In China," he continued, "we should have had that flow ditched and brought

down to the sea long before now, and sold admissions to see the flow at four cents a head."

When the great eruption of 1881 was within a mile of the seashore, and threatened to destroy the town of Hilo, and seasons of fasting and prayer had proved of no avail, a deputation of pagan worshippers went quietly by night to the foot of the stream, made their sacrifices to the goddess Pele, the divinity of the volcano, and departed. The eruption, which had been flowing for nine months, stopped on the afternoon of the next day.

These great outpourings produce two main varieties of lava, considered as to its outward form. One is called the *pahoehoi*, or satin lava; the other is the *aa*, or clinkers. The first form is produced by the flow of very fluid lava over a nearly level surface, leaving a crust as already described; its surface is shining and vitreous, and it spreads itself, in vast contorted masses, over miles and miles of country, its vesicular surface glittering in the sunlight with all the colors of the prism, while its general hue is gray. The second form, the *aa* or clinker lava, is produced by pressure from behind forcing forward the lava current when it is no longer fluid, but is cooled to a degree of viscosity that checks its motion. The most tremendous strain is thus set up in the substance of the lava, and the result is a degree of shattering, torsion, and fracture, which leaves the cooling stream in a state of frightful brokenness and jaggedness. It is as if the drinking-goblets of a million Titans had been shattered and flung down upon the world in colossal fragments of jagged black glass. Walking is impossible over such a surface as this, or if at all practicable it is only at the expense of ruined

shoes, stumblings, and bleeding hands ; though in course of time a trail even over these savage wastes is gradually formed where the need exists.

I have spoken of these streams of lava as bringing destruction in their path. Of course nothing can resist their progress. Whatever cultivation or handiwork of man is in their way is instantly destroyed. Worse than this, the ancient forests and not these only, but the more permanent features of nature herself are obliterated by these vast and resistless torrents. Though the lava on occasion will climb a hill, as I have said, it naturally prefers the valleys, and from these it not only drives off the rivers in clouds of steam, but it fills the valleys to the level of the land around them, and wherever it moves it leaves a gray and fuming surface in place of profuse fertility.

But these streams of lava are creative as well as destructive ; they bring from the depths of the earth the materials of new fertility. The lavas are rapidly decomposed, at least under a rain-fall. Where the climate is perfectly dry, they may lie for twenty or thirty years and seem as fresh as if outpoured the day before ; but rain acts rapidly upon them. I have seen sweet potatoes growing luxuriantly in crevices of a stream of lava which was still smoking, or rather steaming. Finding a place where the fresh lava is sufficiently cool, the natives pulverize it roughly, add a few handfuls of dead grass for a foothold, and in this plant the sweet potato. Under warmth and moisture it germinates rapidly, and in due time produces an enormous tuber which moulds itself into the crevices of the lava, and attains a delicious flavor. I may mention that more than one hundred

varieties of sweet potato are claimed as indigenous to the group.

The soil is entirely composed of decomposed lavas and vegetable alluvium. It is everywhere rich, and in some places deep and extremely fertile. The chief tropical productions are grown with facility: coffee, bananas, rice, cocoanuts, breadfruits, oranges, sweet potatoes, yams, cotton, and tobacco. But the great product of the country hitherto is sugar. No other country in the world gives such a record of sugar productivity to a given area as Hawaii. A yield of three or four tons to the acre, which in other sugar-producing countries is considered phenomenal, is here no more than the average; while five, six, or even seven tons to the acre is not uncommon. In Hawaii sugar is king thus far, and is likely to remain so; but in the case of his dethronement the other tropical products already named will find a profitable development in a favoring soil and climate.

The climate is healthful and extremely equable. There is no word in the Hawaiian language to express the idea of weather. At Honolulu the mean temperature is 75° Fahr., and the daily range seldom over 15°. The extremes of temperature in the shade are 53° and 90°. The excessive heats of our American summers are never known; and in this respect the islands are favored above any other of all the tropics. Nowhere in the world is there another warm climate of the same equability which is free from excessive heat; even among other groups of the Pacific these islands are peculiar in this respect.

What is the cause of this climatic fortune? It has been explained by the Rev. Sereno Bishop, using the

“Challenger” soundings as his data, substantially as follows: In the Atlantic Ocean, the deep cold current from the Arctic and the opposing current from the Antarctic ice flow along the ocean floor until they approach the equator, when they meet, and are thrown up to within 500 fathoms of the surface in a great sheaf or fountain. Thence they return northward and southward upon the surface as heated currents, diffusing tropical temperatures in the course of their flow. In the Pacific a very different course of deep-sea currents exist. Bering’s Strait is a narrow and shallow passage, and cuts off the escape of the Arctic waters southward. There is thus no deep-sea current from the north to meet the corresponding cold current from the Antarctic ice and to throw up its mighty, slowly-moving fountain of waters to be warmed under the equatorial sun. On the contrary, the deep-sea flow of ice-cold water from the Antarctic icebergs moves northward upon the floor of the Pacific for 10,000 miles, nearly from pole to pole, until it reaches the great Alaskan and Asiatic barriers, which throw it to the surface, still a cold current. Thence it returns southward upon the surface as a cool current gradually gaining heat, and reaches the Hawaiian Islands at the tropic of Cancer, warmed to about 70° Fahr., a temperature which it holds throughout the year with great constancy. The islands are thus not only bathed in an ocean of mild and equable warmth, but for thousands of miles the northeast trade winds have swept over the same sea at the same temperature. The sea determines the temperature of the air, and the air has thus the most agreeable of tropical temperatures. Siroccos, tornados such as

those which prevail in Samoa, and the withering heats of our American summer are never known. As a consequence of these unique climatic conditions, the white man easily labors all day long through the warmest season. The farmer can engage in his field work from morning until night without exhaustion; and while there may be some diminution of vigor in this warm climate, still it is the most attractive, comfortable and healthy in the tropical world. Alone among tropical islands, the Hawaiian group presents a desirable climate for the white races. It is true that these Islands do not foster the ardent, unresting activity of the United States and of Europe. But a winter spent in the East tones up the fibres of the American resident, and he returns with new vigor to the duties and pleasures of Hawaiian life.

It may be asked why the Hawaiian Islands do not have the hot and moist climate of islands like Cuba in the North Atlantic and Tahiti in the South Pacific? The answer is implied in what I have already said. Cuba and the West Indies generally are heated by the vast northward set of waters directly from the equator, which bring torrid heats and moisture to these islands. Tahiti and all of the South Sea Islands are warmed by the returning surface currents of the Pacific similarly heated, but flowing southward from the equator. In either case the atmosphere is surcharged with the moisture evaporated by the heated ocean, and we have hot, damp climates, due to hot surface currents flowing from the equatorial region. But in the case of the Hawaiian Islands, as nowhere else, the surface current comes from the polar and not from the equatorial region, and when it reaches that favored group it has acquired the perfect temperature for

human comfort. The Hawaiian seas, in a word, are continually replenished from the cool waters of the north. All other tropical islands are laved in the heated seas that flow from the equator; and even the Micronesian Islands, 3,000 miles west of Hawaii, have no mitigation of the torrid heat. The reason is that there the great equatorial surface current, a heated current, has attained its full breadth and force, and cuts off the cooler surface current from the north.

Thus the Arctic barrier determines a climate of exceptional attractiveness.

What race of people inhabit this earthly paradise?

It is more conveniently described as the brown Polynesian race than by any other name. Distinctly allied with the Malay, and by a still remoter descent claimed to come from our Aryan stock, they form a species that possesses distinct and most interesting traits. Their habitat includes twelve groups of islands extending from Hawaii in the North to New Zealand in the South Pacific, and from the Lagoon Islands in the Central Pacific to Easter Island, a few hundred miles from the coast of Peru. This vast expanse of ocean includes a triangle roughly corresponding in extent to the North American continent; and throughout all this area the brown Polynesian is the only aboriginal inhabitant. He occupies twelve groups of islands: Hawaii, Tokelau or Union Islands, the Lagoon or Ellice Islands, the Phoenix Islands, the Tonga or Friendly Islands, the outlying eastern portions of the Fiji group, New Zealand, Tahiti, the Marquesas, the Harvey or Cook's Islands, Paumotu or the Low Archipelago, and Samoa; and a number of isolated islands in addition like Easter Island,

famous for its pre-historic statues and great stone platforms. Throughout this entire area the race, the language, the manners and customs, the arts and the character are essentially one. I have myself embarked at Honolulu, 1,000 miles to the north of the equator, and going ashore at the Harvey Islands, a thousand miles to the south, have conversed without difficulty in the Hawaiian tongue with the natives of the southern group.

A few words as to the language may be not inappropriate here.

It has about sixteen independent sounds, vowel and consonantal. It had no written literature, but was reduced to writing by the first missionaries, 1820-30, with an alphabet of but twelve letters. The ratio of vowels to consonants in the language as spoken is extraordinarily high. In an Italian sentence the ratio of vowels to consonants is nearly as 2 to 3; in Hawaii the ratio is 3 to 2, or more than twice as great. The result is an extremely musical language. The superabundance of vowels is prevented from cloying the ear by a guttural break that separates two contiguous vowels when one of them is reduplicated, as in the word *a-a* used above.

Sometimes the same vowel is repeated three times in the same word; and it is possible to construct a sentence of half a dozen words or more in which there shall be no consonants whatever, as in the following sentence: "*E i oe ia ia e oo ia,*" "Speak to him now, that he may learn."

Every syllable must end with a vowel,—a phonetic necessity which gives rise to some very peculiar compromises on the part of the native speaker between his language and the English. The name Smith, for in-

stance, in Hawaiian becomes *Kamika*; the language not possessing the sound of *s*, and a vowel of some sort being necessarily interpolated after each consonant. Such a name as *Armstrong* was absolutely unpronounceable. The natives puzzled themselves over it in vain, and finally called it "Lima ikaika," a literal translation of the name.

The Hawaiians, like other brown Polynesians, were great natural orators, full of eloquence and action when their feelings were roused. Like other original peoples, they were full of poetry also, and cultivated several varieties of this art. Their *meles*, or chanted compositions, recorded their history, their geography and their science. Long lines of ancestral rulers or family names were thus preserved, as in the Homeric chants. Their love-poetry was often touching and beautiful, and it contained real sentiment, though it was not always of the most refined. Marriage existed, but its type was not one that civilized peoples would consider very high. Before marriage, perfect liberty was extended to the youth of either sex alike, and what were known as trial marriages were often made, no thought of impropriety attaching to them. If however a child were the result of such a union, marriage usually followed; but marriage among the Polynesians was not the permanent and sacred thing that it is held to be in civilization. These unions were often, indeed perhaps usually, broken after continuing a certain number of months or years, at the option of either party. Children often naturally suffered from neglect, though not nearly so much so as in the countries less favored by nature. It has been estimated that two weeks' labor in the fields was quite

sufficient to support a Polynesian for a year, and under these conditions, of course, the support of children was a much less serious affair than in the cold climates. The pressure upon population was relieved by infanticide. Some years ago I had the pleasure of a correspondence with Charles Darwin upon this subject, and I pointed out that the female children were more frequently sacrificed than the male. (See Darwin's *Descent of Man*, Am. ed., pp. 187, 188, 191.) The newborn children were most frequently the victims; but when their lives were spared for a certain time, the natural dictates of feeling usually triumphed, and the life of the little one was saved. There were, however, instances where infanticide was committed when the child was several years old.

In the main, however, the character of the Hawaiians, as of other brown Polynesians, was extremely amiable. They were affectionate, trusting, and generous to a fault. Hospitality was one of their cardinal virtues; it led, indeed, to an abuse of kindness on the part of many; and a class of indolent persons, known as *hoapili-mea-ai*, "food-friends," was developed; naturally they were looked upon with reprobation. Hospitality was sometimes carried to an extent that was blamable, according to our ideas of ethics. For while the bonds of family were held with jealousy in most cases, yet when a distinguished guest arrived, not only the entertainer's house and food were at his service, but even his wife or daughter sometimes formed a part of the entertainment. This generosity was looked upon with much disfavor by the missionaries. But the usual feeling of the Hawaiian toward a woman who resisted the usage was not of ap-

probation because she was virtuous, but of blame because, as they said, she was "stingy."

With the coming of the new civilization much of this has been changed. The Hawaiians retain their amiable traits, but they have been more or less sophisticated by intercourse with the whites, and they are undergoing rapid extinction and amalgamation with other races. The census now gives a population of about 82,000 in the group, and of these only about 35,000 are pure Polynesian. There are some 20,000 Chinese, nearly all males; 8,000 Portuguese, 5,000 Japanese, 9,000 Americans, English and other Europeans, and several thousand half-breeds. The Chinese are esteemed as good husbands by Hawaiian women, being good providers and reasonably faithful. The half-breeds are a bright and active race.

The government is a limited monarchy, intelligently administered by the native king, Kalakaua.

What is the physical type of the pure Hawaiian?

The men are above the average stature and strength, though under civilization the old chieftains, who were of especially fine physical development, have for the most part disappeared. The Polynesians were the tallest and strongest of races that have anywhere been measured, with one exception—the Tehuelche Patagonians of the eastern coast.

The women are of much smaller stature than the men, but beautifully and voluptuously formed. The chief drawback to their beauty is the flattened nose which belongs to all Polynesian tribes. This is supposed by some to result from the custom of the *honi*, or embrace, which consists of rubbing face to face in-

stead of kissing. Kissing, indeed, the Polynesian considers as a mere waste of time and opportunity.

This amiable race is now in the too rapid tide of transformation ; for it must be said that transformation for the brown Polynesian means destruction. As in all the other Polynesian islands, the aborigines are rapidly passing away under the influence of civilization and Christianity.

What is destroying them? It is not disease or wars ; it is the result of radically new ways of life, forced upon an amiable and receptive people more rapidly than they can receive it. In a century the Hawaiian has made as much progress from barbarism toward civilization as the Anglo-Saxon made in 2,000 years. But that progress is purchased at the cost of his existence. The single present cause of his extinction has been named by Darwin ; it is sterility from changed conditions of life. Few children are born in a family, and of these a large proportion do not survive to maturity. This infertility is the result of the well-meant but fatal experiment that trade and missions have carried out upon this charming people. "The Anglo-Saxon contagion," as Mr. Matthew Arnold has named it, has been especially fatal among every race which has not opposed it. The Polynesian welcomed the trader and the missionary. First he was decimated by foreign diseases, and then he succumbed to the foreign civilization itself. Where Captain Cook numbered 40,000 aboriginal inhabitants, only 35,000 are now left. Another century, and the last of the pure Polynesians will have disappeared, a prey to the "Anglo-Saxon contagion."