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HYGIENE AND SANITATION AMONG THE ANCIENT HAWAIIANS

by

O. A. Bushnell

In the course of gathering material for a History of Infectious Diseases in Hawaii, I have been surprised to learn that, among the numerous published and unpublished works about these islands which I have read, not one of them gives a complete description of sanitary practices among the Hawaiians in the time before the arrival of Captain Cook's expedition in 1778. As a matter of fact, very few people have paid any attention at all to the unromantic details of the business of living even in the years since the islands were discovered. There are many references, of course, beginning with Captain Cook's own Journal, to the difficulties of finding drinking water for visiting foreigners and to the different methods by which water was collected and transported to ships; and in these, as well as in descriptions of the Hawaiians' domestic arrangements and of the novel landscape in which they lived, are found suggestions of the means by which the natives themselves obtained this precious commodity. But none of these narratives gives any information about the methods by which the natives disposed of their personal and domestic wastes. Not until 1880 when, aroused by the nation's dying, Walter Murray Gibson wrote his Sanitary Instructions for Hawaiians, did any writer have the courage to discuss in print the indelicacies of living.¹ By that time civilization had come to the islands with such thoroughness that Gibson was able to commend to the remaining natives the practices and proscriptions which the rest of the world had adopted. After the hundred years of their exposure to the gifts and maladies of foreigners the few Hawaiians who had survived the experience had all but forgotten the ways of their ancestors. And, to judge by the hortatory tone of Gibson's book, they were disinclined to trouble themselves to preserve themselves from extinction by following the new ways of their conquerors.

Reasons for this lack of information on hygiene and sanitation are not hard to find. In the first place, it is probable that the Hawaiians were so secretive about some aspects of their personal hygiene that the peering, prying, note-taking visitors simply did not have the chance to observe them and therefore had nothing about them to record. The alternative possibility must be considered also: if the natives were not secretive, then their "rites of cloacina" must have been so similar to those of the visitors as to be obvious and therefore not worth recording. The Hawaiians' code of taboos was such that, interestingly enough, both explanations are tenable; on one day the whole population could be shockingly, outrageously "indecent", even to sailors who were not easily shocked; and on the next day that same population could be so perversely modest as to leave those same sailors abashed and frustrated. The sailors could hardly be expected to know that the edicts of the priests, rather than an instability of the people, accounted for these extremes in their behavior.

A second reason, and a good one, lies in the very nature of the subject: it is somewhat of an indelicate one to most people, or at least it was so in those times, before the era of impertinent advertising in which we live today, and many a visitor must have chosen to ignore it as being too gross for his attention. Or—even worse to one who searches the literature for such morsels of knowledge as these!—if a visitor was enough of an ethnographer to put his observations into notebooks, all too often the genteel editor who converted them into a Narrative for publication

squeamishly eliminated "indelicacies" from the finished account. The prudish old maids of either sex who edited the journals of the great exploring expeditions of the 18th and 19th centuries were notorious, even in their day, for their zeal in shielding readers at home from the earthiness of life in the South Seas. One has only to compare the journal kept by Cook on his first voyage to the Pacific with the so-called "Official Account" hack-writer Hawkesworth contrived from it, to see how little of Captain Cook and how much of Doctor Hawkesworth was presented by England to an eager public. And one has only to compare the manuscripts of the letters and journals written by Protestant missionaries serving in Hawaii with the scraps and snippets that were permitted to be published by the churchmen in the home office in Boston, or by their descendants in Hawaii, to understand how deserving of a kahuna's curse were those officious puritans who insisted on being censors instead of editors. Many missionaries were excellent reporters of all of the aspects of the strange and savage land which they had come to save for Christ, and they were as detailed in their observations as any scientist could wish. But the effects of emasculating scissors and prim blue pencils are all too evident; and the comparisons are hurtful, in every case, to the published accounts. They make one wonder whether the bowdlerized works are worth reading. The books certainly do not do justice to the missionaries whom they are meant to praise.

In any event, regardless of the reasons for the persistent silence upon the matter in literature, the subject of sanitation is an important one in the history of a people as well as to a historian of its diseases. An account of it ought to be a matter of record, if only to add a missing detail to the picture of a fascinating people who lived in a far-off time. Even now it may be too late for us to be certain that we can reconstruct completely, or correctly, the hygienic practices of a race whose descendants today have almost no knowledge of their past.

My information has been obtained from publications in the history, legends and traditions, religious beliefs, and material culture of Hawaii; from unpublished manuscripts, in English and in Hawaiian, stored in the collections in the Bernice P. Bishop Museum in Honolulu; from an interview with Mrs. Mary Kawena Pukui, a member of the staff of the Bishop Museum, who has shared with me some of her great fund of knowledge about the ancient times; and from my own small store of experience gained during a lifetime in Hawaii.

Traditions, as even a novice historian knows, are exceedingly unreliable bases upon which to reconstruct a people's past; and Polynesian traditions, as Suggs so devastatingly illustrates (and as everyone who has lived among the island people can testify) are notoriously unreliable sources of evidence, not only for the history of two thousand years ago but also for the remembrance of events which happened last week.² The reports of many of the foreign visitors, uninformed, uncritical, imaginative, and gullible as they were, are scarcely more dependable. It would be presumptuous of me, then, to claim that this account of hygiene and sanitation among the ancient Hawaiians, which has drawn so heavily upon such suspect sources of information, presents the true and complete picture of this part of their life before the arrival of the Europeans.

Even the most impeccable of traditions, however, cannot remember as far back as the time of the first people to settle in Hawaii. Ethnologists prefer to put more faith in fishhooks, linguistics, and radiocarbon datings--although there is mounting evidence that these, too, can be as unreliable as gossip, and that the clues obtained from them can only be as dependable as are the people who collect them.³ Although dates for the first settlements in Hawaii have not yet been established, according to Emory et al. pioneer expeditions from central Polynesia probably reached Hawaii about 2,000 years ago.⁴

The sanitary practices of those earliest inhabitants are beyond our ability to reconstruct today. Because of their isolation, and the consequent conservatism of their culture, we can suspect that the Hawaiians did not change their thoughts as easily as they might have changed their handiwork. It is probable that the kapus which governed the sanitary behavior of the Hawaiians in the 18th century, at the time of their discovery by the English, were pretty much the same as those which were imported by their ancestors, upon the first arrival in Hawaii Nei. During the intervening centuries, these kapus may have been elaborated in details, of course, or been simplified, but in their principles they show a remarkable relationship with the codes of behavior which governed the lives of the inhabitants in the rest of Polynesia and in parts of Melanesia.⁵

The kapus of hygiene, then, would appear to be of very ancient origin, remnants of a remote past, perhaps of the ancestral home-land itself. When the pioneer colonists made their first voyages across the beckoning sea those beliefs, and the taboos which sustained them, were so thoroughly inculcated in the people that they were never forgotten, and were never left behind, not even by the sea-farers who, many generations later, reached the distant islands of Hawaii.

These kapus are excellent illustrations of "religious sanctions" as Radcliffe-Brown defined them; those "motives in the individual for the regulation of his conduct in conformity with usage" in his community.⁶ By observing these sanctions the individual Polynesian gained the approbation of his gods and of his fellows, the while he avoided the consequences of their disapprobation. Even more significantly, as we shall see, these particular sanctions of sanitation were invoked and were continued through the successive generations of the Polynesian dispersion; and, whether or not they were intended to do so, they could not fail to play a great part in the survival of the society of which the individual was a member.

The kapus, moreover, may offer clues to an understanding of the psychology of the Polynesians, if the psychoanalytic approach to anthropology and to history proposed by Norman O. Brown should prove to be a valid one.⁷ Brown's fascinating work, relating Occidental culture and history (as well as the neuroses of the Occident's people) to the Freudian concepts of sexuality—most especially to those expressions of the psyche which are influenced by the oral and anal functions of the body—and to the attendant mechanisms of repression and sublimation, is both revealing and unnerving. It is not for me, however, to venture into this esoteric realm in an attempt to extend psychoanalysis to the Hawaiians. I leave that problem to abler exegeses than I.

THE NATIVE SCENE. In this paper my concern is with those aspects of the ancient Hawaiian culture which we might call, in today's terms, personal hygiene and community sanitation, especially as they are related to the disposal of personal and domestic wastes and to the supply of potable water. To help us understand how the Hawaiians dealt with these problems, we need to know something about the world they lived in.

Fortunately for them, their eight great islands and the encircling sea gave them plenty of space to live in. They were not so numerous, or so afflicted with human enemies, that they were forced to huddle together in cities or in fortress-towns, as their kinfolk in New Zealand, Tonga, and the Marquesas were doing. In Hawaii each family lived upon or near the land it cultivated. Usually the cluster of grass-houses which formed a household, a kauhale, sheltered the members of a single family. The minimum number of structures in a kauhale was four: an eating-house for the males, a hale mua, which was also the meeting place for them and their family gods; a separate eating-house for the females and infant boys, the hale 'aina; a house for the women in their times of menstruation, the hale pe'a; and a

sleeping-house, the hale noa, the "house freed of taboos", where the whole family met in social converse and where they slept.

Wealthy families could build other structures around the basic four: a halau, or canoe house, to shelter the precious canoe; a hale papa'a, for storing tools and crops; a hale kuku where women could sit as they made the paper-bark cloth, kapa; a hale kahumu, a cookhouse for use in inclement weather; and others of this utilitarian sort.⁸

A kauhale was established in a place chosen by a consultant authority, whose recommendation of site and orientation was thought to assure health and good fortune for the family which would live there. Because his selection of a site was performed for the sake of each family which sought his advice, this consultant was not required to fit the new kauhale into a planned pattern with respect to the neighboring households.

The result of such personalized placement of homes was a happy degree of freedom, if not of actual disorder. When a number of families chose to raise their kauhale in the same neighborhood, a kind of casual straggly village would grow up. There was no well-defined grid of streets, no city-planner's prescribed and inflexible lay-out, such as is the curse of cities and suburbs today. In a society where too often they were required to conform to strict kapus upon things of the spirit, the Hawaiians were sensible enough to be as unconforming as possible in matters more worldly.

In many places, especially in less fertile districts, it is probable that each of the hardy families which chose to subsist there was not hedged around by neighbors. These self-sufficient folk, like their counterparts in other nations, lived in isolation, unbothered by gossips, priests, and—for most of the time—by tax-collectors. In more comfortable districts, where populations were greater, small aggregations of kauhale were inevitable. These were villages, in every respect, and they were called kulana-kauhale, "places of many households".

Often the inhabitants of a village or of neighboring villages, were members of a clan, united by common interests and loyalties growing out of ties of "blood, marriage, or adoption".⁹ They were governed by a hierarchy of authorities progressing from the elders of the clan, through the priests of the local deities, to the sub-chiefs and, ultimately, to the over-lord chiefs of the district. Such a clan, in the phrase of Handy and Pukui, was "the expanded and all-inclusive family". The Hawaiian name for it was !ohana, the "off-shoots" of a family stock.

There were places, however, where the provident gods were so generous that great numbers of people could be supported in a relatively small area. In such sites, where the soil was rich, the water of life unending, the inexhaustible sea but a short step away, the kulana-kauhale nui, the towns and cities of ancient Hawaii, were established. Waimea, on the island of Kauai, was such a place; the southern coast of Maui, between Kipahulu and Hana, was another; and on Hawaii the deep and lovely valley of Waipio, the green curve of Waiakea, the bosom of Hualalai above the bay of Kealakekua, the fetch of the bay itself, supported large populations.

The Englishmen who sailed with Captain Cook were the first to give us descriptions of those village-towns. In his Journal Cook wrote of the events at Kauai, in 1778, when he and his company were approaching the newly-discovered island: "...We passed several villages, some seated upon the sea shore, and others up in the country; the inhabitants of all of them crowded to the shore and on the elevated places to view the ships...Their houses," he said later, after he had gone ashore to see them, "are not unlike oblong corn-stacks...they have low walls and a high roof consisting of two flat sides inclining to each other and terminating in a ridge, like the thatched houses of England."¹⁰

John Ledyard, Corporal of Marines with Cook, tells of habitations near Kealakekua Bay, such as today, confronted by that barren waste, we can scarcely imagine: The Town of Kireekakooa is about a mile and a half in length, but narrow and of an unequal breadth, and...contains about 1100 houses, some reckon 1300 including some detached buildings. It is situate along the shore within a few rods of the water, and is in general very compact, and as the houses in those places stand so as to create a breadth there are a number of little streets that intersect each other very happily though they do not seem to have been the effects of much design, and a very agreeable and uncommon circumstance to be found among these rude sons of nature, was, that these little avenues were generally paved...The inside of the house is without partitions above or below, the ground within being hard and dry is covered with thick coarse grass, dried plantain and palm-tree-leaves, over which they spread large well-wrought mats, which makes the house cleanly, and gives it an air of elegance and comfort, and as they have no chairs, tables, beds and such kind of furniture there is room enough... There are cocoanut and other trees interspersed artificially among the houses all over the town, and in about the middle of it there is a level course for running and other exercises, which is very beautifully skirted with trees from end to end, and is kept very clean.¹¹

PERSONAL HYGIENE. Kapus and Mana. The kapus which were established by the priests for the disposal of body wastes had a double concern: the protection of the mana, the spiritual power, of the person from whom the wastes were derived; and respect for the mana of all of the gods, both great and small, in all of their manifestations, who resided in the earth, the water, the air, and the sea. Out of respect for the gods, the Hawaiian refrained from polluting their abodes. Out of fear for himself, he was most careful to keep his body's parts, or its wastes, and his personal possessions from falling into the hands of the dreaded sorcerer, the kahuna ana'ana, or into the keeping of an enemy who would give them to the sorcerer to use in his fell ritual.

One of the basic tenets of the Polynesian religion exalted the male principle and subordinated to it the female principle. The mana of males, accordingly, was much greater than that of females; and the higher the rank of the male the greater was the mana he bore. Because the male principle was the vital generative force, the mana of the male genitalia was especially great; and the parts of a man's body, the dejecta which issued from him, the clothing which he wore—especially the loin-cloth which covered the sacred organs—all partook of his mana. The divine force which resided in him was uniquely his, the gift of the gods and of his ancestors since the beginning of time, and it was his to guard. If he should let it be weakened, by breaking one of the kapus, or by permitting those portions of him which were separable from his person to fall into the possession of evil spirits or of evil men, then the greater mana of angered gods, or the enhanced mana of the sorcerer-kahunas who added to their power by capturing portions of his, could visit upon him any or all of the misfortunes known to gods and man. Offenses against the gods, whether they were committed knowingly or unwittingly, were even more serious crimes. Hunger, poverty, disease, and death were only some of the afflictions which could be sent by vengeful deities or caused by the curse of the sorcerer.¹²

Wherever the Hawaiian went, whatever he did, the gods were watching him: his personal gods, the Iaumakua, were there; the guardian gods of his clan were there; and, for all he knew, the four great gods, Kane, Ku, Lono, and Kanaloa, were there also, with their cohorts of "the forty gods, the four hundred gods, the four thousand gods", to take their places if they should be called away, if they should nod.

And on earth, especially if he were a man high in station or rich in enemies, more than likely there would be a sorcerer, too, watching him, or a furtive envious adversary, waiting for the chance to steal from him some of his mana.

With such a police system, such a host of big brothers and spiteful men to spy on them, the Hawaiians probably were the most docile, the most lawful, the most terrorized nation on earth. Rare, indeed, could have been the individual who, out of thoughtlessness or rebellion, broke a kapu of any kind. If he did commit such a crime he did not go unpunished for long: if the priests did not catch up with him his own weakened mana, as nagging as a Freudian compulsion, as unrelenting as any Calvinist conscience, made him pay the penalty the offense demanded. When, in his code, his sin was mortal, he was quite capable of lying down on his mat to die.

The strength of this hold of the gods upon the people—or, better, of the heavy rule of the chiefs and the priests who imposed the kapus in the name of the invisible gods—was so great that it was not broken until more than a hundred years after the English voyagers brought to the islands the first evidences that there were other and greater forces of good and of evil than the manifold gods of the ancient times.

Yet, repressive as was the theocracy which ruled the Hawaiians, we must admit that the effect of its kapus relating to hygiene must have been salutary. No doubt the rewards of obedience to the laws of cleanliness were taken for granted by the people. But the consequences of disobedience were always present to frighten them into compliance, and their dread of the subtle punishments of the body or of the spirit was the goad that made them good. Because of this fear it is unlikely that there was such a functionary as a sanitary inspector type of kahuna among the priestly ranks, numerous and varied as they were. With the kahuna ana'ana around, there was no need to invent the sanitary inspector: each person became his own most careful bodyservant and bodyguard. An alternative explanation, on the other hand, must concede that the kahuna ana'ana might have been a latter-day perversion evolving out of the sanitary inspector priest of earlier societies.

The kahuna ana'ana, with his dark arts, was a priest whose mana was so great that it could command the mana of other persons. According to most of the accounts left to us by native/historians—who, perhaps, are guilty of protesting too much—there were not many of these sorcerers among the priesthood at any time. It is possible, moreover, that in many places where sorcerers were thought to be at work they did not exist in reality. The power of suggestion, potent enough in sophisticated communities such as those in the American culture of today, was quite able to conjure up the effects of sorcery without the agency of sorcerers in the primitive cultures of Polynesia.

Apparently the other kinds of kahunas did not approve of sorcerers or their accomplishments, and they attempted to suppress or ridicule their practices. In consequence the sorcerers went underground, so to speak, becoming all but nameless, and they practiced their black magic in secret. If anything, this recourse helped to increase the fear with which the community regarded them, and enhanced their awful hold upon a susceptible mind, if only because no one could be sure which of his neighbors might be evil magicians. The sorcerers, enjoying this state of affairs, were careful to keep their anonymity. But, excellent psychologists that they were, they never failed to use the most potent weapon in their armament of maleficence: they always managed to let their victims know when they were chosen to be the subjects of the ana'ana.

Once he was aware that he was the target of a sorcerer's baleful attention the victim could fight back, if he felt that his virtue was strong enough to endure a combat; or he could seek the aid of another sorcerer, if he could find one willing

to help him; or, if he was the kind of man who gave up easily, he could submit to his doom. When his offense, whatever it might be, was small, he suffered a comparable misfortune; when, in his arraignment of himself, his crime was great, he went into a rapid decline, and, within a few days, he died. "Prayed to death," the foreigners said, when they learned of these things, filled with shock and indignation and disbelief, and hoping, despite themselves, that such an end would never come to them.

A sorcerer was aided in achieving his dire effects if he could use as bait, as maunu, for the evil spirits a part of his victim's person, or of his possessions, which held some of his mana. The flesh and blood and bones of an individual were rarely available, of course, except when he was wounded or killed; but his loincloth, his urine, feces, hair, nail parings, sputum, nasal discharges, semen, even the sweat of his brow and the scurf of his skin, could serve as bait in the sorcerer's rites. For this reason everyone who had cause to fear the punishment of the gods or the enmity of men lived in concern for the conservation of his mana and was forced to take continuous precaution to prevent any portions of it from falling into the clutches of a sorcerer.

When a man needed to relieve himself he went off into the bush or into the wasteland, apart from the others of his household or village; and there, as a Jew was enjoined to do by the Mosaic Laws, he dug a hole and buried in it the portions of himself that were so indubitably his, together with the leaves or small stones or wisps of grass with which he cleaned himself when he was done. Because, even in the time of his need for privacy, he was well aware of the watching gods, he protected himself, front, flank, and rear, as it were, with a prayer of apology to the resident spirits for his action. This deference was enough, apparently, to placate them. In general, they were a tolerant lot in the face of his need. After all, he could comfort himself, they had made him what he was, a poor thing in need of such coarse ventings. Perhaps, too, Papa, the goddess of Earth, was kind, as mothers are, because she knew that her exigent children had nowhere else to go.

But the Hawaiian did not fear his gods nearly as much as he feared his fellow men; and, because all too frequently he was the witness of the power of men, he carefully covered the cat-hole he had dug and all traces of his visit, in order to hide its secrets from the searching eyes of the kahuna ana'ana.

Others of his personal wastes were not casually thrown away; they were buried, as carefully as was his excrement, or they were burned. Nor were they cast into the sea, or into streams, pools, swamps, taro-patches, or other accumulations of fresh water. Water was the gift of Kane, the paramount god; taro, the most sacred of plants, was another of the manifestations of Kane, the Giver-of-Life, from whom all mankind were descended. A man did not pollute the dwelling places of such a mighty ancestor.

It appears that every male, of high birth or low, sooner or later felt himself to be vulnerable. The chiefs and high priests were especially threatened, because their mana was great, and a rival who could capture and command their power augmented not only his mana but also his reputation and, at times, his political status. Nor were sorcerers themselves immune from the attack of other sorcerers: a stronger one, by defeating the black magic of a weaker kahuna, not only saved the intended victim of the ana'ana but also caused the death of the vanquished sorcerer, usually in a spectacularly violent way.

The story of Lani-kaula, the prophet of Molokai, tells how even good men, even prophets such as he, who could foretell the death of other men, could not save themselves from the power of a kahuna ana'ana.¹³

...It was said that Lani-kaula was a clever prophet in his day. He could foresee the death of any chief or commoner...but when his own death drew near, he did not know. This was the reason...that he did not know.

One morning, one of the overseers of Keahi-a-Kawelo [a sorcerer] of Lanai, passed by. He held a raw sweet potato in his hand, and inside of the sweet potato he had placed the excrement of Lani-kaula. He passed right in front of him, and Lani-kaula did not say, "That is my excrement you are carrying away." Not a word did he say.

The messenger got back to Keahi-a-Kawelo. It was perhaps the night of Kane when a fire was lighted by Keahi-a-Kawelo [on the island of Lanai], and then Lani-kaula knew that it was his excrement that was being burned. He knew that he was going to die. He asked the men of Molokai to make stone knives, and to bury him under those stone knives when he died. He was afraid to be buried with just plain earth, lest he be dug up and his bones be used for fishhooks.

He died and was buried at Pu'u-o-Hoku. The spot was named Lani-kaula for him...

Males among the commoners probably were endangered less often than were men of higher position. Females, unless they were of high rank, were not ordinarily the objects of sorcerers' more harmful attentions. Instead, the magic of a sorcerer would be employed by an eager lover, in order to gain the favors of a beloved. In such an event, the same kinds of bait that were used in drawing sickness and death upon a victim were needed by the kahuna in practicing the hana aloha, the love magic. But here the incantations were different, as well as the prayers uttered by the yearning one. With such entreaties, the mana of the beloved was made captive to the mana of the suitor--how could it resist?--and love, as ever, had its way. Usually a woman was the victim of this gentler form of witchcraft but, love being the double-pointed spear that it is, there were never times when men were exempt from the passions of ardent females and the intercessions of sorcerers.

Parents, or elder brothers and sisters, were responsible for safeguarding the mana of infants and small children until they were old enough to understand their danger and to take care of themselves. The children of chiefs were watched by trusted nurses, servants, or others in the retinue of the parents.

Adult ali'i of great chiefly families were too lordly to be bothered with such offensive details of life, however, and they were provided with facilities which were not available to the general populace, perhaps not even to lesser chiefs. 'Umeke, bowls fashioned from wood, or ipu, hollowed gourds, served as chamber-pots, spittoons, finger-bowls, receptacles for nail-parings, hair, sweat, and skin, and anything else that might issue from the sacrosanct bodies. It was the responsibility of the retainers who were entrusted with these utensils to proffer them when they were needed, to guard their contents and to dispose of them with the prescribed caution, and to clean the vessels for the time when they would be employed again. Some of the 'Umeke used by the most arrogant chiefs were tastefully decorated with inlays of teeth or pieces of bones taken from slain enemies, whose mana, thus captured and thus degraded, was made to suffer insult even after death.¹⁴

Women were subject to the same laws as men. But they were also burdened with the need to safeguard those other excreta peculiar to their sex and function: menstrual discharges, the fluids released at childbirth, the placenta, and, less out of concern for themselves than for the newborn offspring, the navel-cord that, being severed, released the child into the world of fear. The umbilicus of a chief's child was especially sacred, and usually it was buried in the earth or

hidden in the cracks of a cliff consecrated to the spirit-guardians of the family into which the child was born. Such a cliff is found at Mauna Kapu, near the falls of the Wailua River, on the island of Kauai. Sometimes, however, the piko, that link with the ancestral mana, was not buried but was dried and carefully preserved among the child's insignia of rank and lineage.

Although, at this late date, we cannot be sure that hygienic codes and practices did not vary among different districts or among the several islands in the archipelago, it is likely that most of the aboriginal Hawaiians followed this general system of kapus for the secret disposal of their personal wastes.

Apparently there was nothing like a family privy or a community latrine in ancient Hawaii, as there was in New Zealand; at least there is no mention by archaeologists or philologists of such homely devices among the Hawaiians. According to Elsdon Best the mana of the community latrine, the paepae of a Maori village in New Zealand was so potent that it held "...the power of being able to prevent or avert the effect of the anger of the gods and the shafts of magic..." In the Ngau Paepae Rite, "an extraordinary custom" as Best called it, a sick person was taken to the latrine in order that he might bite ngau the beam of the latrine. In this way, we must assume, he received into himself some of the community's commingled mana to replace the force which had been stolen from him.¹⁵

In Hawaii, nonetheless, there were certain periods, "the times of the long taboos", when either the power of the sorcerers was interdicted by higher authority or else the populace found its safety in sheer numbers. These periods of religious observances, when all of the usual activities of the people were halted, lasted from three to ten days. On such occasions, when chiefs and priests were busy with their ritual in the temples, commoners were confined to their households. Sometimes they were required to maintain an absolute silence, not only of themselves but also of their children and their animals. At these periods of great solemnity a whole village would be permitted to use certain prescribed sites as privies. Separate places were reserved for males, of course, and others were set apart for females and infant children. Place names on some of the islands probably commemorate such long kapus: Miana, "the place for urinating", is applied to a site in Waimanalo on Oahu; and Ki'ona wawana, "rough dung heap", is an ancient name for another area on Oahu.¹⁶ One of the long kapus was known as Ke Kapu o ka Mau'u mae, the "Taboo of the Wilted Grass", because during its observance "each man urinated in a particular spot only, where the grass wilted."¹⁷

Even when he was travelling, far from his home and village, a Hawaiian was required to keep the kapus against pollution. If the needs of nature came upon him while he was at sea, or while he was crossing the hallowed precincts of one of the great deities—as, for example, the terrifying realm of Pele, the goddess of fire, at the volcano of Kilauea—he uttered his prayer of apology and carefully disposed of the evidence of his passage.

The Fire Goddess, it was easy for him to see, kept a certain regard for the cleanliness of her abode. As any mortal nose could detect, Pele's privy was located in a distant corner of the great crater, in a place we call today, so prosaically, the sulfur banks. The kukae of Pele was the golden excrement of sulfur which, in her haughty self-assurance, she did not bother to hide from the sight of sorcerers.

But, auwe noho'i e! What else can we expect of such an explosive, undisciplined, self-willed force as Pele? She is really a messy thing, to be candid about her: the long glassy filaments of hair combed from her smoky mane are scattered for miles around her dishevelled boudoir, even her tears lie glittering in its dust. One suspects that this rebellious female, enjoying her wildness in a masculine world, would have taken a scandalous pleasure in spilling her burning blood upon the very doorstep

of a sorcerer, in hanging her pyrophanous pa'u from every rafter in his house.

Yet, disdainful as she was of men, she did not dirty her whole domain. Naturally, then, she is indignant at the nuisances committed, without apology or consideration, by the many foreigners who have invaded her palace, to gape at its stony magnificence. Offended by their litter, outraged by the cesspools and privies which the encroaching hotels and homes have dug into her estate, she has fled to other refuge, and rarely comes anymore to live in Kilauea.¹⁸

Bathing and Washing. In other respects, also, the primitive Hawaiians were a clean folk. Most of the earliest visitors remarked upon this fact. William Ellis, one of the ship's surgeons with Captain Cook, wrote in his Journal: "Both men and women are very cleanly in their persons; the latter wash their whole bodies in fresh water twice, and sometimes three times a-day..."¹⁹

Ebenezer Townsend, supercargo of the American sealing ship Neptune, recorded the same impression in 1798:

They certainly are the most cleanly people that I have seen. They bathe a number of times every day, they do nothing scarcely without bathing after it; they bathe immediately after every repast. As far as we can judge from appearances they are a very happy people...²⁰

Most of the Hawaiians lived along the shores of their islands, near enough to the sea to be able to swim in it as often as they wished. They were almost as much at home in the sea as the fish were, and most of them must have learned to swim at the same time they learned to walk.

The few people who lived inland, too far away from the sea to enjoy its sports and its cleansing, bathed in streams or mountain pools, or in auwai, irrigation ditches, which carried water to the taro patches. Every valley on the windward coasts of the islands had its stream and at least one clear pool, and residents of those valleys were rarely, if ever, without ample supplies of fresh water.

Those who bathed in the sea rinsed the sticky salt from their bodies with fresh water, when it was plentiful, or with brackish water from shore pools and springs. If these conveniences were not available, then they stayed sticky and itchy.

People who had the inclination to do so could anoint themselves with coconut oil, rubbing it into the skin and hair. Often the oil was scented with aromatic herbs or flowers. Such frequent bathing and anointing could not help but keep them clean of body. It did not rid them of their lice, however, as some romanticists have claimed (if, indeed, they would admit that their idealized Hawaiians had lice): entomologists agree that the hardy louse is not so easily drowned, either in water or in coconut oil.* The realist Hawaiians were well acquainted with lice, which undoubtedly migrated with the pioneers from central Polynesia. This is one plague which cannot be blamed upon Captain Cook and his company. Mr. Bayley, the expedition's astronomer, noted that Hawaiians had lice "in great numbers" in their hair, as, indeed, so must have many of the British sailors, if not Mr. Bayley himself. Accepting these uku as one of the established phenomena of life, the Hawaiians used more direct means of removing them, as men and monkeys have always done. Fortunately, Hawaiians were not burdened with much in the way of clothing, and their problems of louse-control were kept to a minimum. As Mr. Bayley also observed, most of the natives wore their hair short, "in order to destroy the lice",²¹

*The legend has been a persistent one, ever since John Reinhold Forster, one of the naturalists with Captain Cook on his second voyage to the Pacific, first wrote of the cleanliness of the Tahitians and of their methods of louse control, in his Observations Made During A Voyage Round the World, on Physical Geography, Natural History, and Ethic Philosophy, published in London in 1777.

When water was scarce, as in the leeward regions of the islands, people who insisted on living there either went dirty or else adopted a variety of substitutes for bathing. Mrs. Pukui tells of the ingenious method devised by members of her clan in arid Ka'u,²² The family's jesting name for it is "half-a-bath". Dirt and sweat were scraped from the body with bruised leaves and young twigs of ilima plants (Sida spp.), which thrive in such hot dry places. This athletes' rubdown removed most of the evidence of a day's exertions, and the fresh subtle scent of the ilima helped to mask whatever could not be scraped away by the strigils.

Soap as such was not known to the Hawaiians, although they may have used some of the saponaceous native plants which their own observations or those of the herbalist kahunas discovered to them. One of these plants, Colubrina asiatica, called lanapanapa in Hawaii, is distributed throughout a range extending from Africa to eastern Polynesia. It should have been familiar to the Polynesians from the time before they began their voyages across the great ocean. The leaves of this plant, according to Neal, "form a lather in water and have long been used as soap on Pacific islands".²³ Whether or not the Hawaiians used these soapy plants the cleansing of bowls, gourds, and other household utensils made of wood or stone was done primarily with sand, dirt, scouring stones, and lots of hard scrubbing. Their good sense in using leaves for plates and fingers for forks relieved them of a great deal of scullery work which more acquisitive cultures insist upon performing, even in this day of push-button kitchens.

Because fingers were their usual serving implements, the Hawaiians never ate without washing their hands before and after a meal. The Reverend Mr. John D. Paris, new to Hawaii in 1841, was not the first to praise this hygienic habit, but he described it more succinctly than most when he wrote in his Journal of the time he came as a guest to the eating-mat of Job Lilikalani, a chief of Ka'u: "Then fingers were washed, for Hawaiians eat not except they first wash."²⁴

Ali'i were provided with finger-bowls, but commoners were content to use the nearest available body of water, or fresh water poured upon their hands from a narrow-mouthed gourd.

Oral Hygiene. Although visitors have been exclaiming over the Hawaiians' beautiful teeth since the instant the English first saw them, even those handsome sets of teeth needed to be cared for. Most people did not bother to do so, judging from the incidence of dental caries, pyorrhea, and other pathological conditions detected in the skulls of aborigines who are presumed to have lived and died before the islands were discovered.²⁵ But, for those who cared, there were the equivalents of toothpicks in splinters of bone, shell, or wood; of toothbrushes in stems of grasses and rushes and in the pith of sugar-cane; and of mouth-washes in water scented with a variety of herbs or flowers. The very scrupulous are said to have used salt, charcoal, or fine pumice as dentifrices.²⁶

Menstruation. During the time of menstruation a woman was ritually unclean to the other members of her family, both male and female: "woman was then defiled, for the gods despised all bloody things".²⁷ To avoid giving affront to gods and to people, she was forced into seclusion in the hale pe'a (the menstrual house) for those periods "when Lehua shed her tears". She fashioned tampons from pieces of clean kapa, often using remnants of her own skirts. She was prohibited from using the cast-off pa'u of other women, even of her sisters; she was even forbidden to use portions of her own kihei, the cape-like garment which was worn over her shoulder. "What belongs above should stay above, and what belongs below should stay below," was the rule, not only for the making of menstrual pads but for all forms of dress.²⁸

When pulu, the soft downy material which covers the fronds of the hapu'u tree

fern (Gibotium splendens), was available many women used it as an absorbent packing for the kapa-wrapped tampon. Because "blood is sacred, blood is life," the soiled pads could not be burned. At the end of her period of isolation a woman buried them in the earth around the hale pe'a. The precincts of the menstrual house were so charged with the uniquely feminine essence of defilement that men were forbidden to go near it. If a man entered the hale pe'a the price of his intrusion was death. Even women who were not menstruating dared not enter. When one of them brought food to a woman in seclusion she wore a lei fashioned from a leaf of the sacred ki plant (Cordyline terminalis) to protect her from defilement, and she left the food at the door of the house. When her period was ended a woman could not rejoin the household until she had taken a bath of purification:

...a woman bathed in her own pool that was set apart for the purpose of removing defilement. When that was finished she went to the house in front where her husband, the kahunas, the kuhikuhi puuone (orators and readers of omens) were. She was then cleansed by the kahunas and permitted to associate with her husband.²⁹

If it should happen that her infirmity came upon a woman while she was traveling she turned again to the ki for help: with leaves plucked from a wayside plant she prepared leis for her wrists, ankles, and throat. With these, and a prayer of apology, she appeased the gods until she was able to reach the seclusion of a hale pe'a. Men who might be traveling with her also wore the protective amulets of ti leaves. When they wanted to be especially sure to gain the gods' forgiveness the men carried the entire leafy capital of a ki plant before the unfortunate woman.³⁰

Subincision. An operation which seems to have been practiced among many Polynesian tribes, and which early explorers usually mis-named a circumcision, was performed on a young male when he was about seven or eight years old. It was not so much a true circumcision as a slitting of the prepuce (kahe ule).

Only kahuna trained in the art performed the operation. The sharp knife used was made from bamboo...The kahuna slit the foreskin, letting it contract of its own accord or gently pulling it back. He then slipped a clean morning-glory blossom over the penis, which protected the wound and helped it to heal.³¹

The occasion did not seem to have any ritual meaning for Hawaiians, not even as a rite of passage, and was performed primarily "to facilitate cohabitation and enhance the pleasure enjoyed."³² Obviously it conferred certain hygienic benefits as well.

COMMUNITY SANITATION. Rubbish heaps, too, could be offensive to gods as well as to men. In Hawaii they were probably modest and harmless accumulations of plain dirt and of animal and vegetable debris which was inedible even to the scabbling pigs, dogs, chickens, and rats roaming the villages. If ever, in those times of uncertain food supplies, there were crumbs and leftover morsels of food from the mats in the eating-houses, they were never thrown away: they were burned. Nor did the household middens receive any of the personal wastes of the family, not even their worn-out clothing: these, too, were burned or buried.³³

For those households established near the sea the ocean was never used as a means of disposing of sewage or of rubbish. Inedible portions of fish, like the viscera, scales, fins, and bones, were given back to the sea, as offerings to the gods and spirits who lived in its depths.³⁴ They showed their appreciation for such courtesies by sending more fish to feed upon those offerings. A virtuous household was never hungry.

Agricultural Interlude. The benefits to agriculture which might have been gained from the use of these assorted materials as manure were lost, unfortunately,

Hawaiians do not seem to have used manure of any kind, not even that from domestic animals, in the cultivation of crops. Animal droppings were unclean, unpleasing, defiling. They were left where they fell, except in sacred places like the temples, where they were removed by servants or by slaves. The contributions of humans to the organic content of the soil were so scattered that most of them must have been wasted upon stones and tares.

The only fertilizer applied to their dry-land crops was the ash from brush and grass which was burned when a field was prepared for planting. A taro patch received a kind of green manure of dead leaves and other vegetable matter, like taro peels, carried to the paddy from the family midden. All of this was trampled into the mud of the lo'i and allowed to decompose before the sacred taro shoots were planted.

Even long after the arrival of foreigners many Hawaiians could not be persuaded either by economical New Englanders or by frugal Chinese, to use animal manure or human excrement as fertilizer for their plants. The missionaries' despair over the natives' refusal to grow vegetables in a place where once, long before, a pig-pen or a chicken-house had stood, may amuse us now but it was irritating to the Calvinists, who saw in such unthrifty behavior one more proof of the natives' fatal lack of a sense of husbandry.

Probably, by that time, the more civilized Hawaiians were expressing a purely aesthetic revulsion over the thought of growing foodstuff out of excrement. Certainly they were not any longer concerning themselves over the mana in the droppings of animals, or in those of humans, either. A coy footnote in Brigham's classic work on the ancient Hawaiian house shows how completely the overthrow of the gods and the abolition of the kapus in 1819 brought to an end the power of the kapus to keep the villages clean:

In the early sixties I heard in the Haili Church at Hilo a capital sermon in Hawaiian, the text being from Deut. 23, 13.* It was brought home to the simple Hawaiians by the suggestion !Consider poor pussy!, and from my observations at that time I do not doubt the congregation needed the practical sermon of the excellent missionary.³⁵

WATER. Water was precious, a gift from the great gods Kane and Lono. Clouds from which fell the rain were some of the many forms of Lono; the sweet water of the land was Kane-wai-o-la, Kane the water of life.

Primitive Hawaiians made great effort to keep the sweet water of the land free from pollution: they obeyed the kapus not only for their sakes, who were the users of the water, but also out of respect for the great gods who brought it down to earth from the heavens, and out of consideration for the feelings of the mo'o, those spirit-beings who lived in water wherever it was found.

If their great gift was not properly appreciated the gods could take it away: Lono-of-the-heavy-cloud would not come to the mountain peaks, the coursing blood of Kane would dry up.

Hearken to the story of the water-hole at Kawaihoa Point, near Koko Head on the island of Oahu. It was the only spring to be found for miles around, in that dry and desert region. As long as the water taken from it was used for drinking only, to sustain the lives of thirsting men, the water of Kane flowed freely. But when white men came to live nearby and, ignoring the warnings of the children of the land (as is the invariable practice of haoles everywhere) they used the water not only for drinking but also for bathing and for the washing of their dirty clothes--ahh, then did

*"And thou shalt have a paddle upon thy weapon: and it shall be, when thou wilt ease thyself abroad, thou shalt dig therewith, and shalt turn back and cover that which cometh from thee."

the spring cease to flow.

The sons of the land knew how to make their apologies to Kane. They sought an 'ulupa'a maiden, a girl who had not yet menstruated, and they sent her to the unflowing water-hole of Kawaihoa with a sacrifice of pig. Hearing her prayer, accepting their apology, Kane permitted the water to issue forth once more from the rocky ground. But, as a sign of his lingering displeasure with the wasters of his bounty, he did not let it flow as freely as before.

Alas! The story does not have a happy ending. The unlearning haoles again used the water for their laundering. This time Kane took away his gift forever: no more did the water flow forth from the spring of Kawaihoa.*

In ancient times there was no municipal service to bring water to the kauhale, the household. Each family obtained its own water from whatever source was available to it. Members of the household fetched it from springs or streams or irrigation ditches, transporting it in long gourds, ipu wai or hue wai, stoppered with plugs of wood or of rolled leaves, or with slender tapering shells saved from the sea.³⁶

Apparently there were no kapus which restricted the water-carriers' chores to certain members of the household; everyone assisted in this service, except for women who were confined in the menstrual house, and one of the first labors performed by a child was the transporting of water in a gourd he could carry. "Ka nui e pa'a ai i ka hue wai," said the people of Ka'u of a two-year-old child, "the size that enables him to carry a water-gourd".³⁷

One of the great blessings of these islands, today as in the olden times, is the abundance of their rainfall. There is no reason to believe that the bounty of Lono was less generous in those days than is the annual precipitation of the geographical present. Dwellers on the windward coasts, where rainfall is heaviest, probably never lacked water. The many streams issuing from the deep wet valleys lying beneath the cloud-catching peaks gave ample water for irrigation and for domestic use. In consequence those were the places where the greatest concentrations of people were found. And it was upon their villages that European sailors looked most eagerly, as they cruised past the foaming waterfalls, the green valleys, the bowered habitations, while they searched for a landing place.

Every voyager who has ever come to Hawaii by sea has been impressed with the beauty of the islands. And almost every voyager, it seems, has written about them. But the most lyrical description of the idyllic landfall which has been left to us by any of the earliest visitors was written by the misfortunate de la Perouse in 1786, as his ships came sailing along the southeastern coast of Maui, at the end of a long journey from Easter Island.³⁸ Here, set down for the despair and the envy of all of the world's romantics, in every place and in every time, is the enchantment and the wonder of every weary sailor who, from the rail of his ship, has gazed longingly out upon a new Eden rising from the sea:

The aspect of the island of Mowee was delightful...We beheld water falling in cascades from the mountains, and running in streams to the sea, after having watered the habitations of the natives, which are so numerous that a space of three or four leagues may be taken for a single village: but all the huts are on the sea-coast, and the mountains are so near, that the habitable part of the island appeared to be less than half a league in depth...The trees which crowned the mountains, and the verdure of the banana plants that surrounded the habitations, produced inexpressible charms to our senses; but the sea beat upon the coast with the utmost violence, and kept us in the situation of Tantalus, to desire and devour with our eyes what it was impossible for us to attain...

*The tale was related to me by Mrs. Pukui; the language is mine.

To Europeans, yearning for an anchorage where they might refresh themselves after perilous months at sea, the prospects offered to them by such landfalls as this were delectable. For most of them who came to the obliging Polynesian Paradises—except for poor de la Perouse, who seems to have been the most consistently unfortunate commander of the most ill-fated expedition in all the history of the Pacific—the rewards in water, in fresh foods, in willing women, were so fabulous that the islands of the Pacific have not yet recovered from the legends and the lies which the wanderers, in their enchantment, took home with them.

But almost invariably the same moisture-laden winds that brought rain to the lofty mountains prevented those eager Europeans from landing where water and food were to be found most plentifully. Paradise was not easily gained. Usually the hapless mariners were forced to sail past the inviting valleys on the windward coasts and to double back along the dry leeward shores before they could find safe harbor: there winds were tamed by the bulwark mountains, and waves were smoothed away. But there, too, rain was almost entirely shut out, and water was as precious a commodity to natives as it was to needy visitors.

The ships of Captain Cook, for example, spent eight weeks off the windward coasts of Maui and Hawaii, looking for a bay protected enough to drop anchor in. But the winter winds were so boisterous and the seas were running so high that the Englishmen dared not send their small-boats to shore. Not until two months after they first saw the tantalizing land did the expedition find harborage in Kealakekua Bay, on the hot dry coast of Kona on Hawaii; and they put in at that unlikely place only because it offered the first adequate supply of fresh water they were able to reach—a brackish pond and a muddy well.

And poor de la Perouse! After the visions of Paradise he and his impressionable Frenchmen beheld on the Hana coast, where did their dismal luck give them a landing place? Ke-one'o 'io—La Perouse Bay, it is called today—is a tiny cove of deep blue sea, rimmed about by the black lava flows which formed it: a beautiful thing, in itself, to look at, perhaps, but then—as now—probably the most desolate inhospitable waterless spot on all that pitiless coast of Maui.

Yet people lived even on those sere and sun-burned shores. And they lived in the uplands, also, where water, when it did fall from Lono's clouds, was not content to stand, but must go rushing down to the sea or must sink deep into the porous thirsty lava. How did those dwellers in the dry lands supply their needs?

They caught the rain, of course, whenever it did fall, trapping it in wooden bowls or wide-mouthed gourds, in the hollowed trunks of trees, and in the hulls of upturned canoes so placed against the side of a grass house as to receive the water when it dropped from the thatch. Coastal swamps, surface puddles, boggy soils, any place where the water stood long enough to be scooped up and carried away, these were not scorned. Ground-water, percolating through the layers of lava, was collected in gourds and calabashes as it dripped from the roofs of caves and lava tubes. The morning dew and the evening mist were stripped from leaves of plants and grasses, even from sheets of oiled kapa or from finely woven mats set out of doors.

In short, the Hawaiians employed every method for acquiring water which their means and their ingenuity could devise. Needy as they were, they might also have used the rain water which was trapped in the cavities of hollow trees, but I think we can be permitted to doubt the veracity of the account of the cistern tree which Mark Twain wrote in 1866. In the typical jeering style he adopted whenever he wrote of the natives of Hawaii, the sassy correspondent, "that American Patron Saint of Mendacity", as Alexander Hume Ford called him, sent this silly tale back home to the mainland for the instruction of the readers of his Letters from the Sandwich Islands:

...a species of large-bodied tree grows along the road below Waiohinu (in Ka'u) whose crotch is said to contain tanks of fresh water at all times; the natives suck it out through a hollow weed which always grows near. As no other water exists in that wild neighborhood, within a space of some miles in circumference, it is considered to be a special invention of Providence for the behalf of the natives. I would rather accept the story than the deduction, because the latter is so manifestly but hastily conceived and erroneous. If the happiness of the natives had been the object, the tanks would have been filled with whiskey.³⁹

The recollections of Sereno E. Bishop are more reliable. In his Reminiscences of Life in Old Hawaii he told of the method by which water was brought to the homes of missionaries at Kailua, Hawaii, in the 1830's:

The drinking water of the people was very brackish, from numerous caves which reached below the sea level. The white people, and some chiefs had their water from up the mountain where were numerous depressions in the lava, full of clear, sweet rain water. There were also many tunnel-caves, the channels of former lava-streams. Sometimes the fine rootlets of ohia-trees penetrating from above, festooned the ceilings of these dark lava-ducts as with immense spider webs. If in a dry season, water was lacking on the open ground, it could always be found higher up on the mountain in such caves. Twice a week one of our 'ohuas or native dependents went up the mountain with two huewai, or calabash bottles, suspended by nets from the ends of his mamaki [sic] or yoke, similar to those used by Chinese vegetable venders. These he filled with sweet water and brought home, having first covered the bottles with fresh ferns, to attest his having been well inland. The contents of the two bottles filled a five-gallon demijohn twice a week.⁴⁰

The authenticity of this description is beyond dispute: in dry Kailua there was no other way to obtain sweet water, whether for missionaries or for chiefs. The chiefs who chose to live there had been sending their retainers on such errands for generations, and they instructed the servants they assigned to the missionaries to treat the newcomers with the same devotion.

Springs and Wells. Springs were numerous, and every one of them that bubbled up along the whole coast of an island was known and named, even those that came up in the sea, beyond the edge of land. It was no great feat for an aquatic native to dive into the sea with an empty water-gourd and to come up with it filled with cold fresh water. The village of Punaluu, on the south shore of Hawaii, was famed for its submarine springs: its very name tells that it is a place where one dives to find the springs.

Shallow wells were dug or were built in a great number of places on the leeward coasts of all the islands. The remains of many are found today, in areas which have been almost abandoned by people, and a few of them are still yielding water.

The Geologic and Topographic Map of the Island of Maui, prepared by Stearns and Macdonald in 1942⁴¹ and that of the Island of Hawaii, prepared by the same authors in 1946⁴² show a number of "water holes or ancient Hawaiian wells" scattered along the leeward coastlines of the two islands. In their section on the geology and ground-water resources of the Island of Maui they state:

The sites for wells were presumably located by noting springs at low tides along the coast or by tasting water in cracks along the coast. Two types of wells were made. One type was made by blocking crevices in the lava with rocks, mud, and straw on the seaward side to prevent the inflow of water. Large rocks were placed in position for steps to make access easier. The other type was made by excavating loose clinker a'a (rough lava) to the

basal water near the beach...Such wells were lined with big boulders if necessary to keep the clinker from caving. The water in many Hawaiian wells is too brackish to drink, if one is not accustomed to it, but the Hawaiians are noted for their ability to drink brackish water.⁴³

One well of the second type, near Makena, on the southern coast of Maui, was still in use in 1942. A similar one, at La Perouse Bay a few miles away, was probably the one from which the French ships obtained a meager supply of drinking water during their brief stay in 1786.

On Oahu, according to Mc Allister, ...none of the wells are deep; they amount to shallow holes in the ground, with sides evenly faced with stones. Water is obtained through seepage, and the level of the well is consequently affected by the rapidity with which the water is removed.⁴⁴

An idea of the quality of this water—and of the need which compelled both the Hawaiians and their European visitors to drink it—can be gained from the entry in Captain Clerke's log for February 22, 1779:

All the Water this place affords is brackish, here is a Pond & a Well, the Water of the Pond has so strong a twang of the Salt as to be very disagreeable to the Palate and I believe obnoxious to the Bowels—the Well is situate among some Rocks under a Hill on ye Eastern side of ye Bay but so near the Water side that when the Surf runs the least higher than usual it breaks into it so that it is only in a very fine Weather any Water can be got from thence and then its source is so small that it will not produce in the course of a day above 4 or 5 Ton [casks] at most and this not perfectly free from saline particles though I believe good & wholesome Water, at least we found no inconvenience from the use of it but as I am still deficient in this essential articele I must repair to A'towi where we know the Water to be very excellent and complete stock...⁴⁵

Although no evidence has been found that Hawaiians used filters or straining devices to remove visible dirt and debris from their drinking water, there is no reason to doubt that they were capable of making them. People who could show disgust at the sight of a fly imprisoned in a bowl of poi were not likely to overlook means to obtain clean water.

Even though drinking awa was the privilege of chiefs, the process of straining the freshly prepared potation, in order to remove the grosser particles of root (and the froth of saliva) was well known to all the people. Brigham knew of "three implements used as convenience served" in the straining of awa:

First, the funnel (made from a gourd with a narrow neck) could be partly filled with vegetable fibre and the liquor poured through this; second, a special strainer was made from a gourd bottle, the neck being loosely filled with fibre. The third was perhaps the most ancient form, and was a coconut cup with the 'eyes' enlarged slightly.⁴⁶

Similar devices for cleaning dirty water, using pieces of kapa, or fibers of grasses or sedges, or layers of the fine matting which is formed at the base of a coconut frond, would have been obvious to people as observant as the Hawaiians were. Filters prepared with cinders, sand, or charcoal packed into lengths of bamboo were not beyond their means, but we do not know whether such devices were made.

Whatever its source, water was not easy to get, and obtaining it required constant attention and considerable work. We need not wonder that it was considered to be precious, a gift of the gods. When it was brought home it was not wasted.

Indeed, water was so hard to get that the inhabitants of one place, at least, became notorious among their hospitable countrymen for their unwillingness to share the valued fluid with strangers. According to Simeon Nawa'a, who told this story to

Mrs. Pukui in 1945, this is how Nanakuli, a little village on the western coast of Oahu, gained its name:

The people who lived in that district were ashamed to greet passing strangers, because of the great scarcity of water and vegetable food. When they could not hide, or were forced to meet strangers, they just looked (nana) at the newcomers with expressionless faces and acted as though they were stone deaf (kuli), and did not hear the greetings. This was so that the strangers would not ask for water, which they did not have in that locality. There were a few brackish pools from which they obtained their drinking water, and it is only when they went to the upland of Waianae that they were able to get fresh water. They carried the water home in large calabashes hung on mamaka, or carrying sticks, and used their water very carefully after they got it home.⁴⁷

Uses of Water. Almost all water brought to the household was used for drinking purposes or for washing the hands. Lesser amounts were needed in preparing poi, by mixing the water with the pounded cooked corms of the taro. Because all kitchen utensils were made of wood, stone, or shells—there was no metal and no pottery in ancient Hawaii—very little water was used in cooking.

To a lesser degree, it was employed in the preparation of !awa by those few males who preferred to macerate the narcotizing root in water rather than have the family's females chew it for them and spit the mixture of saliva and pulp into the !awa bowl. When medicines were compounded by herbalist-physicians, the kahuna lapa!au, water was needed in some of the prescriptions and for some of the treatments. The occasional lustrations and ceremonies of purification for cleansing an individual of his religious pollution, if they did not prescribe complete baths, required relatively little water. This sanctified form was usually provided by the officiating priest. For such ritual occasions sea water was preferred. If it was not available, fresh water could be used alone or an artificial sort of sea water could be prepared by the addition of a pinch of salt and a dash of powdered turmeric root.⁴⁸

Laundering was not an arduous task in the olden times, inasmuch as the papery kapa could not stand much of a wetting. It could be sponged off, in a superficial way, but it could not be soaked, beaten, and wrung out as cloth fabrics can be treated. Because of this fragility kapa garments were worn until they were so tattered and so dirty that they could be used no more. Then they were discarded—with the necessary precautions for protecting the mana of the wearer, of course—and a new garment was assumed.

In those places where water was plentiful and relatively easy to obtain, no doubt it was used more generously in the household for washing bodies and for cleaning personal possessions and kitchen utensils. Usually, however, it was easier and more enjoyable for the gregarious folk to take themselves and their things to the source of water.

At streams and rivers special places were reserved for filling the ipu wai with drinking water, while other places were set aside for bathing and washing and for laundering. The usual rule of all primitive folk was followed: drinking water was taken upstream from the sites allotted the other activities. At springs the punawai themselves were used for filling water-gourds, the run-off for bathing and washing.

The kapus were not relaxed at those public places, however, nor were the concerns of the people for safeguarding their mana. Even while they bathed or surfed, they or trusted friends or relatives had to keep watch over their clothes, their adornments, even their leis, to make sure that none of the tempting bait would be stolen away by a sorcerer.

CONCLUSIONS. By now it will be evident that no one dared or even wished to pollute a water supply with excrement or rubbish or other forms of defilement: such an affront to the gods and to the mo'lo would have been unforgivable, the insult to other people would have been enraging, and punishment from them, if not from the gods, would have been swift and hurtful.

As a result the valley streams, with their faery pools, must have been as idyllic as travel posters and technicolored movies of today would have us believe, and the whole Hawaiian countryside must have been as unpolluted and uncluttered as a sanitarian's heaven. There were no lumpy turds, no glairy contraceptives, no sneaky peers, in the streams and bathing beaches of those days. There were no equivalents of rusting beer cans and broken pop-bottles, or of waxy sandwich wrappers, shreds of paper napkins and sherds of paper plates, of windrows of aluminum foil and brittle cellophane and yellowing newspaper, adorning the landscape, making it to blossom like a universal midden. If only for this reason we can almost be sorry that gods and sorcerers have lost their hold upon the minds and manners of the unprincipled Yahoos who inhabit our islands today..

The cost in time and labor—and in anguish of spirit—enforced upon the primitive Hawaiians by the kapus of hygiene must have been immense. But the recompense was also great: the people were clean, and the land they lived in was clean. The absence of litter, and of those malodorous accumulations of filth which imparted the stink of civilization to the habitations of mankind throughout the rest of the world in those days, must have been gratifying even to the innocent eye and the untutored nose of the "savage Hawaiian".

But more valuable than these aesthetic rewards were the safeguards to personal and to public health which were the natural consequences of the strict compliance that the kapus demanded: the hazards of polluted foodstuffs, were very much reduced, if they were not actually removed; and the opportunities for the transmission of most forms of pathogenic microorganisms among the population were also diminished, if not eliminated.

Ulcers duodenal and gastric they might have known; some of them probably enjoyed, even as do we, the neuroses of anxiety, the subtle escapes of schizophrenia and the glowering violences of paranoia; they most certainly shared such an array of compulsions as would make an analyst marvel. But they could never have been afflicted with epidemics of infectious diseases.

However much we today may deplore the psychological traumata which were the price the aboriginal population were required to pay for their protection from infectious diseases of the body, we must, nonetheless, concede at least a grudging tribute of recognition to the efficacy of the kapus of hygiene which gave the people this relief from the burden of microbial disease.

And, while we are rendering this duty, we ought to offer the tribute of awareness of their role in safeguarding the life of a race to those very ancient observers, the earliest of the priest-scientists of the Polynesian peoples, who, in their remote homeland, before the time of the great dispersion, first divined the laws of sanitation and first proclaimed them in the taboos which the descendant tribes carried with them in their migrations across the great sea. Regardless of their rationale, those taboos—ritual sanctions in every sense of the term—were remarkably effective devices for maintaining the disciplines of sanitation under circumstances where natural laziness, carelessness under hardship, even an understandable human despair in the face of peril, might so easily have permitted the wanderers of the sea to jeopardize their health, and their chances of survival, by abandoning their discipline over themselves.

In my opinion, these laws of hygiene—and, even more important, the degree to

which the entire population obeyed them--provide one set of evidence to support my thesis that the aboriginal Hawaiians were an extraordinarily healthy people, who were afflicted with no important infectious diseases in the centuries of isolation which intervened between the end of their intercourse with Tahiti and the time of their discovery by Captain Cook. There are other kinds of evidence to sustain this thesis, of course, and I hope to present them in their proper place.

NOTES

- 1 Walter Murray Gibson, Sanitary Instructions for Hawaiians (Honolulu: 1880).
- 2 Robert C. Suggs, The Island Civilizations of Polynesia (New York: 1960).
- 3 Kenneth P. Emory, Report on Hawaii and Tahiti. Abstracts, Tenth Pacific Science Congress (Honolulu: 1961), p. 60.
- 4 Kenneth P. Emory, W.J. Bonk and Y. Sinoto, Hawaiian Archaeology. Fishhooks. (Honolulu: B.P. Bishop Museum Press, 1959).
- 5 S.M. Lambert, A Yankee Doctor in Paradise (Boston: 1941).
- 6 A.R. Radcliffe-Brown, "Social Sanctions," Encyclopedia of Social Sciences, XIII (1933), 531-534.
- 7 Norman O. Brown, Life Against Death (New York: 1959).
- 8 E.S.C. Handy and Mary Kawena Pukui, The Polynesian Family System in Ka'u, Hawaii (Wellington, N.Z.: 1958), pp. 7-12.
- 9 E.S.C. Handy, Polynesian Religion (Honolulu: B.P. Bishop Museum, 1927), p. 2.
- 10 James Cook, Journal (of the Third Voyage to the Pacific Ocean), 1778-1779. PRO Admiralty, Supplementary Series II, Logs, No. 112. Typescript of Hawaiian portion in Archives of Hawaii, Cook Collection.
- 11 John Ledyard, A Journal of Captain Cook's Last Voyage to the Pacific Ocean and in Quest of A North-West Passage, Between Asia and America... (Hartford, Connecticut: 1783), pp. 128-219.
- 12 Handy, op. cit.
- 13 Anonymous, Answer to Lanikaula, in Ke Ku'oko'ia, July 18, 1868. Trans. Mary Kawena Pukui.
- 14 W.T. Brigham, The Ancient Hawaiian House (Honolulu: B.P. Bishop Museum, 1908), p. 187.
- 15 Elsdon Best, "Maori Medical Lore," Journal of the Polynesian Society, XIV (1905), 1-23.
- 16 Mary Kawena Pukui, Personal Communication, 1960.
- 17 Mary Kawena Pukui and Samuel H. Elbert, Hawaiian-English Dictionary (Honolulu: 1957), p. 224.
- 18 Mary Kawena Pukui, Personal Communication, 1960.
- 19 William Ellis, An Authentic Narrative of A Voyage Performed by Captain Cook and Captain Clerke, 1776-1780 (London: 1783), p. 152.
- 20 Ebenezer Townsend, Extract from His Diary, 1798 (Honolulu: Hawaiian Historical Society, 1905), p. 26.
- 21 William Bayley, Manuscript Journal of William Bayley, Astronomer with Captain Cook, kept on Board H.M. Sloop Discovery during the Years 1777 and 1778. Typescript in Archives of Hawaii, Cook Collection, copied from original in Alexander Turnbull Library, Wellington, N.Z.
- 22 Mary Kawena Pukui, personal communication, 1960.
- 23 Marie C. Neal, In Gardens of Hawaii (Honolulu: B.P. Bishop Museum, 1940), p. 22.
- 24 John D. Paris, Fragments of Real Missionary Life (Honolulu: 1926).
- 25 H.G. Chapell, Jaws and Teeth of Ancient Hawaiians (Honolulu: B.P. Bishop Museum, 1927), p. 19.
- 26 Ibid., p. 27.

- 27 S.M. Kamakau, "Ka Moololo O Hawaii", in Ke Au Koa, November 10, 1870
- 28 Handy and Pukui, op. cit., p. 182.
- 29 Anonymous, "Hawaiian Customs in Ancient Times," in Ka Leo o Ka Lahui, April 25, 1894. Trans. Mary Kawena Pukui.
- 30 Mary Kawena Pukui, Personal Communication, 1960.
- 31 Handy and Pukui, op. cit., pp. 94-95.
- 32 Ibid., p. 95.
- 33 Ibid., p. 182.
- 34 Mary Kawena Pukui, Personal Communication, 1960.
- 35 Brigham, op. cit., pp. 187f.
- 36 Ibid., p. 143.
- 37 Handy and Pukui, op. cit., p. 178.
- 38 J.F.G. de La Perouse, Voyage Round the World (1785-1788), English Edition (London: 1807), p. 36.
- 39 Mark Twain, "The Cistern Tree" in Letters from the Sandwich Islands (Palo Alto: 1938), p. 202.
- 40 (Honolulu: 1916), pp. 14-15.
- 41 H.T. Stearns and G.A. Macdonald, Geology and Ground-Water Resources of the Island of Maui, Hawaii (Honolulu: Territory of Hawaii, Division of Hydrography, 1942).
- 42 H.T. Stearns and G.A. Macdonald, Geology and Ground-Water Resources of the Island of Hawaii, Hawaii (Honolulu: Territory of Hawaii, Division of Hydrography, 1946).
- 43 Stearns and Macdonald, ...Maui, pp. 127-128.
- 44 J.G. McAllister, Archaeology of Oahu (Honolulu: B.P. Bishop Museum, 1933), p. 35.
- 45 Clerke, op. cit.
- 46 W.T. Brigham, "Vegetable Crockery of Old Hawaii," Mid-Pacific Magazine, IX, No. 12 (June, 1915), 539.
- 47 Simeon Nawaa, Personal Communication to Mary Kawena Pukui, 1945.
- 48 Handy, op. cit., p. 145.

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