Hereditary Factors Underlying the “Destructive Trinity of Diseases”: Syphilis, Leprosy, and Tuberculosis in 19th-Century Hawai‘i\(^1\)

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**Summary**

After the death of Hawai‘i’s ruler, Kamehameha IV, in 1863 until the defeat of the Home Rule Party in 1902, Hawai‘i encountered turbulent confrontations by outsiders regarding the hereditary succession of its rulers. It was also during this period that new claims were tested in Hawai‘i as to the speculated inheritance of particular diseases. Three diseases common among Hawaiians and Euro-Americans during this period are reviewed: syphilis, leprosy, and tuberculosis. Particular attention is devoted to the timing and the extent to which hereditary conceptualizations of these diseases were challenged by the Germ Theory, an explanation of disease that gained considerable support in at least some parts of Europe and the United States during the second half of the nineteenth century. Source material for disease in the Hawaiian Islands is drawn from published medical and public health reports, patient narratives, ethnographical accounts, scientific expedition reports, travelogue memoirs, and historical writings on tropical medicine, population, race, and culture. This paper provides us with further interpretations of ways in which ‘inheritance’ and ‘heredity’ were applied to states of disease within different cultural perspectives across the globe during this critical time of change regarding concepts of heredity.

\(^{1}\) An earlier version of this essay was presented at an invited Cultural History of Heredity Conference at the Max-Plank-Institute for the History of Science, Berlin, Germany (Wilson, 2005, pp. 213-232). The comments that Kerri A. Inglis and Garland E. Allen provided on an earlier draft of this essay are greatly appreciated. The use of diacritical marks in written Hawaiian words, now standard in academic scholarship, is a step towards restoring accurate pronunciation and meaning to the Hawaiian language. In this way, the Hawaiian speaking people, both past and present, are literally and figuratively regaining their proper voice—a voice that historians, folklorists, and other scholars have long silenced in their accounts.
Hawaii faced a number of significant disease outbreaks during the 1800s. Venereal disease began devastating the native population soon after it arrived via Captain James Cook's sailors and continued, despite missionary attempts of Christian cleansing, to ravage islanders for many years. The Okuu (probably Asiatic cholera) was introduced perhaps as early as 1804\(^2\), with measles following in 1848. Smallpox arrived in Oahu in 1853 claiming at least 5000 lives, then returned in force in the early 1880s\(^3\). Tuberculosis became endemic among the Hawaiian island populations during the 19\(^{th}\) century, just as it did across the globe. And leprosy, possibly first identified in Hawaii as early as 1819 by members of a French scientific expedition, troubled not only the afflicted, but also their families as it precipitated a legal segregation and isolation of the diseased to Kalawao (and later Kalanapapa) on the Hawaiian Island, Moloka'i. Finally, what has been characterized as the bubonic plague swept through the islands in 1899.

The 'infectious' diseases mentioned above were frequently described in the 19\(^{th}\)-century accounts written in Hawaii by Euro-American physicians, missionary settlers, expeditionary voyagers, and itinerant travelers — all haole (white foreigners), hapa (part) haole, or Hawaiianized haole\(^4\). However, scholarship to date has yet to cover the entire spectrum of illness and disease as experienced during this period. In particular, little mention is made of 'inherited' or 'hereditary' disease in recent writings about the Hawaiian kanaka (people) of the 1800s\(^5\). This paucity of information is puzzling. For when one peruses 19\(^{th}\)-century Euro-American medical writings and patient narratives, one finds that disease — or at least the propensity to disease — was commonly viewed as being hereditarily transmitted. This claim is true even for many of the so-called 'infectious' diseases mentioned above. It is also puzzling in that among the Polynesians, the Hawaiian islanders were a hereditary conscious group.

Pedigrees, in the form of epic genealogical chants have long been a part of Hawaiian culture. Kinship was, in the 19\(^{th}\) century, an important concern for the kānaka maoli or ʻōiwi (people of the bone) as well as for the aliʻi (ruling families). Hawaiians had established families of ruling chiefs as a class distinct from

\(^3\) Greer, 1969, pp. 37-88.
\(^4\) Following the intellectual fervor that O.A. Bushnell and C. S. Judd used in explaining the birth and significance of diseases in 19\(^{th}\)-century Hawai'i, see Igler, 2004, pp. 693-719.
\(^5\) See, for example, Green and Beckwith, 1926, pp. 176-208; Larson, 1962/63, pp. 29-33; Blaisdell, 1989, pp.1-21.
common islanders\(^6\). But the Hawaiian *kānaka* became increasingly worried throughout the 19\(^{th}\) century about the repeated threats to the hereditary rule of the islands. Ascribing to a belief that the “nation lived while his [Kamehameha’s] descendants lived and ruled”, both natives and rulers remained focused upon the struggle to maintain this hereditary rule. Thus, thinking about the possible hereditary nature of diseases was, to some degree, a natural extension of the hereditary-mindedness among the *kānaka maoli*.

This paper begins to uncover, or more precisely, to recover some 19\(^{th}\)-century viewpoints about ‘hereditary’ disease in Hawai‘i. It explores the meaning(s) of heredity in regard to what have been deemed as Hawai‘i’s “destructive trinity of diseases”: syphilis, leprosy, and tuberculosis\(^7\). Having examined the concept of ‘hereditary disease’ of this time in other papers\(^8\), I will begin here to explore the extent to which hereditary conceptualizations of these three diseases in Hawai‘i conformed with those expressed in Euro-American writings. To reassess just what natives and newcomers may have viewed as ‘hereditary’ regarding both native and foreign disorders suffered by people in Hawai‘i during this period, the existing literature must be questioned anew. Nineteenth-century medical and public health writings and travelogue memoirs are used herein to capture contemporary perspectives of the Hawaiian people. These writings supplement native perspectives from cultural luminaries of the period including David Malo, Samuel Manaiakalani Kamakau, and John Papa Ii. Prior to turning to examine specific diseases, it may be helpful to identify several traditional Hawaiian cultural beliefs concerning heredity, healing, and disease.

*Traditional Hawaiian Beliefs Concerning Heredity and Disease*

Inheritance was a traditional concern among native Hawaiians in regards to health and disease. Indeed, ancestry was as important for the pedigree of the healer as for that of the sufferer. For example, Kamakau recounted that only if the *kahuna līʻau lapaʻau* (medical healer) is “an upright person” – one who is pure and clean of person and deed, who “obeys the laws of that land as well as those of the *akua* (god or goddess)”, – only then will he be “guided

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\(^7\) Mouritz, 1916, p. 58.  
properly by true revelations of his spirit guides” in that the “secret things of his ancestors” will be revealed to him⁹.

Knowledge that certain illnesses were “inherited in a family through generations”, was a common belief to all kanaka maoli. The “secret things” that medical kāhuna received from their ancestors included wisdom about treating diseases that an ‘aumakua (deified ancestor) or a kumupa‘a (ancestral deity) passed along hereditarily. These diseases were known to be “very resistant”. They did not “respond to [regular] medicines” and there were “not many kāhuna who are able to work on [them]”. Healing “could not be done by outsiders or strangers because their voices and appeals would not be heeded by the ‘aumakua”. Since these diseases had been introduced through familial lines, it was more “the work of the family” than of the kāhuna in overcoming them¹⁰.

Newborn babies were generally inspected by a “kāhuna of predispositions” (kahuna pa‘a‘o‘ao). If a baby was found to be ill, it was imperative for the kahuna pa‘a‘o‘ao to ascertain whether or not it was “an ailment that afflicted the ancestors, coming down from them and afflicting the parents and then the child”. For if such ailments were not promptly and properly treated, the child was likely to suffer from “a more severe ailment” in adulthood¹¹. Untreated hereditary predispositions were believed to hold the capacity for changing into adult diseases including generalized states of emaciation, localized swellings, or specific disorders including tuberculosis.

Hereditary diseases represented a particular grouping of disorders that were commonly understood around the world as being capable of manifesting themselves throughout many generations. However, within Hawaiian cultural belief, a hereditary disease could be manifested for all future generations. Since a “relationship” had been forged “between ‘aumakua and descendants”, the Hawaiian people became “actual children (keiki ponoi) of the gods”. Therefore, a hereditary influence over illness and disease held the potential to last forever¹².

The meaning of “forever” in regards to inheritance in Hawai‘i was challenged during the later 19th century as islanders faced repeated threats to the hereditary rule of the islands. After the death of Hawai‘i’s ruler,

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⁹ Kamakau, 1964, p. 95.
¹⁰ Ivi, 1964, p. 97.
Kamehameha IV (Liholiho), in 1863 until the defeat of the Home Rule Party in 1902, Hawai‘i encountered turbulent confrontations by outsiders regarding the hereditary succession of its rulers. Curiously, it was also during this period that many new claims were being tested in Hawai‘i as to the inheritance of particular diseases. This paper explores the meaning of heredity in regard to syphilis, leprosy, and tuberculosis during this time frame of threat upon the Hawaiian belief of hereditary rule.

**Syphilis**

It could be easily assumed from standard historical accounts that describe syphilis arriving on the Sandwich Islands with Captain James Cook’s men in 1778, and its quick and wide-spread devastation, that contemporaries viewed syphilis solely as a contagious, infectious disease. William Ellis, the surgeon’s second mate aboard Cook’s ship, *HMS Discovery*, conjectured that it was only since the arrival of his ship that the island natives had become diseased “in a violent degree”. He identified European voyagers as the underlying “cause of this irreparable injury”\(^\text{13}\). Alonzo Chapin, one of a series of nine missionary physicians sent to serve the medical needs of the Hawaiians, claimed in 1838 – a half-century after Cook’s men established contact between the Hawaiians and “the other” – that

> Those, who have the credit of the discovery of the islands, and of exhibiting first to the astonished gaze of the simple and ignorant natives, some of the ingenious and useful implements and commodities of enlightened lands, and who sailed ships so enormous in size as to have been regarded as floating islands, inhabited by supernatural beings, must also receive credit of having introduced among these islanders […] the vilest and most loathsome disease ever sent as a punishment for transgression\(^\text{14}\).

Chapin, in remarks of 1850, cited syphilis as “the most prominent cause of the decrease in population” of Hawaiian natives\(^\text{15}\). Though census

\(^{13}\) Ellis, 1782, pp. 73-74, as cited by Stannard, 1990, p. 329. For other broad analyses of Cook’s impact upon the island from an infectious diseases perspective, see Stannard, 1989; Bushnell, A, 1993; Bushnell, OA, 1993.

\(^{14}\) Chapin, 1838, as reprinted in Halford, 1954, p. 291.

\(^{15}\) Chapin, 1850, p. 93. This view is also apparent in blanket statements by historians who claim, the “white man’s presence was killing the Hawaiians”, Daws, 1973, p. 74.
tabulations of this era leave room for speculation as to the precise population counts, there is general agreement among scholars that the number of native Hawaiians declined sharply between 1778 and the second half of the 19th century. As the Hawaiians “died off”, what one literary scholar described as a “strange cosmopolitan society of Chinese, Japanese, Portuguese, half-breed and Americans sprouted in their stead”. Many of the haole elite in Hawai‘i hurled scorn against the largest immigrant population at mid-century. Chinese men, in particular, were viewed as being “unchaste” and “whose cohabitation with Hawaiian women was doing nothing but contributing to their [the Hawaiian] continued infertility”.

This so-called “sliding way of death” prompted considerable reaction. On one level, the government expressed concern to “cease or at least limit” the importation of Chinese laborers. Such efforts, however, were also seen by many authoritative figures as counterproductive to the new plantation needs as sugar increasingly became the unofficial, corporate King of the Islands. Another King, Kamehameha IV, worked on a different level to develop public health measures against syphilis. “Our first duty is that of self-preservation”, the King claimed. “Our acts are in vain unless we can stay the wasting hand that is destroying our people”. Consequently, the Queen’s Hospital was opened in 1859. Devoted primarily to care “for sick and indigent Hawaiians”, this hospital opened a syphilitic ward within its first year.

But what of heredity and syphilis? Infection, regardless of its source, was not the only cause associated with the spread of this disease. Knowledge of ‘hereditary syphilis’ was propagated through the medical textbooks that Western-trained missionary physicians added to their collection while working

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16 State statistician Robert C. Schmitt’s numbers show a diminished percentage of “native” Hawaiians among the people on the Hawaiian islands from 95.8% in 1853 to 28.5% in 1896. In identifying what contemporaries as well as later scholars viewed to be the likely causes for this decline (Schmitt, 1968, p. 159) the “role of syphilis has been mentioned frequently”. Trask (1993, pp. 6-7) argues that an even more drastic decline occurred beginning from a considerably larger initial native Hawaiian population.

17 Carré, 1930, p. 237.
19 Judd, 1977, p. 593, attributed the use of this term to O.A. Bushnell.
22 Wilson, 2003, pp. 18-21.
They diagnosed this disorder in newborns upon finding a particular constellation of visible signs. These manifestations were also what foreign visitors “inspected” and noted in their recollections of syphilis amongst the Hawaiians. But to many Hawaiians, the signs of syphilis held meanings beyond those recorded in the medical literature.

As noted earlier, syphilis was tied to the arrival of Captain Cook. According to Hawaiian cultural belief, Cook was the avatar who personified the white god Lono. Lono had once been present among the Hawaiians, but had gone away. Cook’s appearance was commonly touted as Lono’s return. Upon Cook’s arrival, Hawaiian’s claimed, “Now our bones shall live” because “our ‘aumakua (ancestral spirit) has returned.” Within the genealogical tradition of Hawaiian gods and priests, Cook’s own death had been a foretold event. According to some contemporary accounts, Cook’s (Lono’s) revenge or wrath for his death would be delivered via later personifications of Lono who, in turn, were connected to Cook through their godly or priestly inheritance. Accordingly, some Hawaiians perceived that the syphilis spreading amongst them was the physical manifestation of Cook’s revenge being delivered unto them through the hereditary lines of the god Lono.

Some Hawaiians explained this hereditary transference or transmission of disease in terms of mana. Mana was “the creative power” that Hawaiians describe as “making visible what is invisible, causing things to be seen, which is the same as making them known or giving them form.” Views attributing disease to supernatural, spiritual causes were consistent with the aims of the kahuna lā‘au lapa‘au (medical healer) and the Hawaiian missionary. The spirit’s underlying disease would, Hawaiian healers claimed, remain active for

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23 Such 19th-century textbooks, according to Halford, 1954, pp. 131-132, included Benjamin Bell’s Treatise on the Venereal Disease, Alphée Cazenave’s On Cutaneous Diseases, M-F. Xavier Bichat’s Epitome of Physiology, Anatomy, and Pathology, Samuel Solomon’s Guide to Health, and John Mason Good’s Study of Medicine. Distinctions that 21st-century medical writers draw between ‘hereditary’ and ‘congenital’ were not so clear in the 19th century.

24 For an overview of the importance of “reading” marked children in Euro-America during this era, see Wilson, 2002b, pp. 1-25.

25 Cultural anthropologist Marshall Sahlins, 1995, analyzed this view of Cook as Lono, defending his interpretation against that postulated by Obeyesekere, 1992. O.A. Bushnell also incorporated the Hawaiian view of Cook as Lono in his well received fictionalized historical account, The Return of Lono: A Novel of Captain Cook’s Last Voyage, a work that originally appeared as Peril in Paradise (1956).


generations and could return along specific lines of inheritance to inflict successive members in a family’s lineage.

Christian missionaries also kept the hereditary thinking about syphilis alive as they spread their word to the peoples of Hawai‘i. Underlying disease, promiscuously-spread disease in particular, lay original sin. This disease, as William Bliss, one nineteenth-century traveler to the Islands noted, represented the “iniquity of the parents […] visited upon the children, even to the third and fourth generations”\(^{28}\). Christianizing the islands would, the missionaries hoped, cleanse the morality of the people, thereby blocking further “inheritance” of syphilis derived from original sin. Such reform would spare the “third and fourth generations” and sway the trend away from the demise of the native population. With this frame of mind, missionaries – and missionary physicians – focused particularly on Christianizing the *kua‘āina* (rural folk in the hills and valleys) whom they perceived had been “beyond [the] reach of procurers and poxed foreigners”, who had “refused to tolerate intimacies with foreigners”, and who had “no taint of venereal diseases”. For it was the *kua‘āina*, the missionaries claimed, that held great potential for the “preservation of the [native] race”\(^{29}\).

Alcoholism has been one of the “bad habits” frequently associated with the spread of syphilis\(^{30}\). Alcoholism was also a disorder that, throughout the 19\(^{th}\) century, was often claimed to have a hereditary etiology\(^{31}\). This view, common in Euro-America, also gained support among the Hawaiians. Lunalilo, while prince and king, was known to be “constantly tempted to indulge his inborn craving for drink”, in that he was “lacking the constitution” to resist the temptation\(^{32}\). The incidence of alcoholism in Hawai‘i may have been exacerbated by another type of hereditary factor. Many *kānaka maoli* in the 19\(^{th}\) century grew increasingly concerned about the depopulation of the natives and the threat of the complete disappearance of the “Hawaiian race”. When coupled with threats against maintaining hereditary rule over the islands, worry over these concerns was frequently palliated by alcohol.

By the early 20\(^{th}\) century, prominent Western medical authors still acknowledged heredity as an underlying cause of syphilis. Sir William Osler

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\(^{28}\) Bliss, 1873, p. 76.

\(^{29}\) Halford, 1954, p. 98.

\(^{30}\) Wilson, 2003, pp. 18-21.

\(^{31}\) Bynum, 1984, pp. 59–70.

argued that cleansing “parents before marriage” remained the “most certain prophylaxis” against the hereditary spread of syphilis – that “most tragic form of the disease”\(^3\). In Hawai‘i, missionaries, physicians and native islanders agreed that uncontrolled, syphilis would continue its wrath through its hereditary spread to future generations. Uncontrolled, syphilis was also thought to be able to transform or metastasize into another disease – leprosy\(^3\).

**Leprosy**

Leprosy, a disease known for centuries throughout Europe, became a major health concern closely intertwined with Hawaiians during the mid 19\(^{th}\) century. As Nathaniel Emerson, the physician son of a Hawaiian missionary, observed, the “roots” of leprosy are “very deep and are intricately interwoven with the whole fabric of the community”\(^3\)

Native Hawaiians came to believe that they held some special susceptibility to leprosy that was not seen in the *haole* living on the islands. According to one government physician, George Fitch, the *haole* have “acquired a kind of hereditary immunity to leprosy as a result of centuries of exposure in Europe”\(^3\). Even the licentious *haole*, who readily contracted syphilis, were deemed to be “protected” from what Fitch viewed as the “fourth stage of its consequence” – leprosy.

Missionary physician, Dwight Baldwin, noted the presence of leprosy on the Hawaiian Island of Maui as early as 1840. However, the Berlin-educated


\(^3\) George L. Fitch, physician to the Kalaupapa leper settlement from 1882 to 1884 widely endorsed this view. Other physicians who spent time in Hawai‘i – as did others across the globe – noted the great difficulty in differentiating signs of leprosy from those of syphilis. Kneeland (1873, p. 405) depicted leprosy as “inseparably mixed with syphilis”. Frank Enders (1877, p. 719) viewed leprosy “not as a disease *sui generis* but [as] an offspring of syphilis”. He reaffirmed this view citing the beliefs of other physicians that “the eradication of syphilis from these [Hawaiian] Islands, would eventually cause the disappearance of leprosy”.

\(^3\) Nathaniel Emerson to Rudolph Meyer, 3 January 1889, as cited by Daws, 1973, p. 78. Insightful overviews of leprosy within the Hawaiian peoples are found in many works, including Stoddard, 1895; Thompson, 1897; Mouritz, 1916; Weymouth, 1938, pp. 153-183; Farrow, 1954; Wellman, 1968; Bushnell O. A., 1963 and 1968; Kalisch, 1973; Judd, 1984; Gussow, 1989; Castillo, 1992; Veith, 1992; Moblo, 1997; Merwin, 1998; Herman, 2001; Gould, 2005; Tayman, 2006; and Inglis, forthcoming.

\(^3\) Daws, 1973, p. 133.
physician, William Hillebrand is typically credited with having noted its first appearance in Honolulu in 1848. Many blamed the introduction of this “fresh item of the infinite curse which has come upon this [Hawaiian] race” upon the Chinese\(^{37}\). Indeed, local Chinese were familiar with this disease in their homeland, and thus, the islanders began to colloquially refer to it as *ma‘i Pāke* (the Chinese disease).

The afflictions of leprosy became well known to people on all the Hawaiian Islands\(^{38}\). Its manifestations were remarkable. One well known piece of historical fiction recounts an 1893 episode of meeting people with leprosy. The individuals were

monsters – in face and form grotesque caricatures of everything human. They were hideously maimed and distorted, and had the seeming creatures that have been racked in millennia of hell. Their hands, when they possessed them, were like harpy-claws. Their faces were the misfits and slips, crushed and bruised by some mad god at play in the machinery of life. Here and there were features which the mad god had smeared half away, and one woman wept scalding tears from twin pits of horror, where her eyes had once been. Some were in pain and groaned from their chests. Others coughed, making sounds like the tearing of tissue. [Some] were idiots, more like huge apes marred in the making, until even the ape were an angel. They mowed and gibbered in the moonlight, under crowns of drooping, golden blossoms. One, whose bloated ear-lobe flapped like a fan upon his shoulder, caught up a gorgeous flower of orange and scarlet and with it decorated the monstrous ear that flip-flapped with his every movement\(^{39}\).

For a decade after its first description in Honolulu, leprosy was hardly mentioned in the growing number of travel accounts of Hawai‘i. Mark Twain, for example, omitted any reference to leprosy in his well known *Letters From Hawaii* because, according to historian A. Grove Day, Twain “did not wish to frighten off the business men who would be his most important readers”\(^{40}\).

However, among the people of Hawai‘i, both native and *haole*, leprosy hardly held a threat to visiting foreigners. Although the mode of its transmission was unclear, most initially viewed that it did not spread in a contagious manner. Writings of the period strongly suggest that physicians

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\(^{37}\) Bishop, 1966, p. 223.
\(^{39}\) London, 1914, pp. 50-51.
\(^{40}\) Day, 1977, p. 65.
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and Hawaiians deemed that leprosy was “somehow transmitted along hereditary lines”\textsuperscript{41}, for the “leprous taint” was observed to run “strong in many families”\textsuperscript{42}.

Such a view was consistent with the concurrent claims half-way across the globe in the leprosy asylums in Norway. There, Daniel Cornelius Danielssen and Carl Wilhelm Boeck had concluded from their studies that leprosy was passed along familial lines\textsuperscript{43}. This view was also consistent with the Hawaiian missionaries’ Biblical account of inheriting leprosy as a curse. The curse of Elisha seemed to be “irrevocably fixed” upon the Hawaiian just as the leprosy of Naaman was cursed to “cleave unto thee and unto thy seed forever”\textsuperscript{44}. Yet within this framework of thinking, another Biblical message resonated within the Hawaiian population. For similar to the treatment of “lepers” in the Biblical era, measures were soon undertaken in Hawai‘i to segregate “the lepers” from the “cleane”. To briefly review this action, we turn again to Dr. Hillebrand.

William Hillebrand remains a complex figure in the Hawaiian history of the 1860s\textsuperscript{45}. Regarding leprosy, he seems to have served several masters. It was Hillebrand who initially claimed that the leprosy in Hawai‘i owed its importation to the Chinese “coolie” labor force. Such medical concerns, however, did not prevent him, in 1865, from acting, as the King’s appointed Commissioner, to procure additional coolie plantation labor. That same year, Hillebrand prompted the Legislative Assembly to establish a leprosy Hospital and Detention Center in Kalihi that would help to better identify and contain people with leprosy in Honolulu. Once detected, these individuals were, according to the 1865 segregation “Act to Prevent the Spread of Leprosy”, sent off to the newly acquired governmental land at Kalawao, on the eastern side of the Hawaiian Island of Moloka‘i.

The history and lore of “the lepers” at Kalawao, and later after the transfer of this settlement to Kalaupapa (traditionally known as Makanalua) on the northern side of Moloka‘i has been retold – frequently embellished – in much of the history and literature of Hawai‘i. Most common is the tale of Father Damien, the Belgian Catholic priest of the Sacred Hearts, who arrived at

\textsuperscript{41} Daws, 1973, p. 6.
\textsuperscript{42} Bishop, 1966, p. 223.
\textsuperscript{43} Rokstad, 1964, p. 65.
\textsuperscript{44} Bliss, 1873, p. 97.
\textsuperscript{45} For a recent overview of one passion of Hillebrand’s life, see Meier, 2005.
Kalaupapa in 1873 to offer spiritual and physical care for several hundred people with leprosy secluded there, and who, eleven years later, was diagnosed with and subsequently died from leprosy. As Kerri A. Inglis has insightfully argued, this singular focus on Damien has “served to overshadow the stories of the patients, mainly Native Hawaiians, [...] who suffered from leprosy and society’s treatment of the disease, [...] and] who were exiled to the settlements” at Kalaupapa. The focus on the man, Father Damien, has also overshadowed the way in which the land on which he worked, Kalaupapa, also represented a cornerstone for the study of a reputed hereditary disease.

Leprosy was, as noted above, known to afflict members of different generations within one family, but curiously this pattern of transmission appeared only in some families – even when looking at just the native Hawaiian community. Such transmission could, of course, have been explained by contagious spread among members of a household that often included several generations of family members living closely together. However, more often than not, leprosy appeared only in a few individuals of one family’s generation, sparing most of the family members, all of whom had been in relatively similar contact with each other. Moreover, many kōkua (caregivers) voluntarily worked amongst the people inflicted with leprosy in the isolated community at Kalaupapa, yet they never contracted leprosy. Was some form of protection from this disease hereditarily transmitted? Or, was it a weakened physical constitution among the afflicted that had been passed along family lines?

‘Hereditarians’ were initially startled when news reached Hawai‘i from Norway regarding Gerhard Henrik Armauer Hansen’s 1873 isolation of rod-shaped bodies routinely observed microscopically in the mass of bacteria present in nodules of leprous patients. However, neither Hansen nor his contemporaries could demonstrate a clear causal relationship by inoculating “clean” animals or humans with material taken from a leprous nodule. Thus, Hansen’s findings prompted little change of thinking in Hawai‘i – at least initially.

Leprosy was becoming a “national blight” for Hawai‘i. Forty-eight Protestant ministers, both Hawaiians and haole, who gathered at the 1873 Hawaiian Evangelical Association meeting conjectured that “our Hawaiian

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46 Drawn from a manuscript of Inglis’s forthcoming book, Ma‘i Lepela: A History of Leprosy in 19th C. Hawai‘i.
people will become in a very few years, a nation of lepers”\textsuperscript{48}. Indeed, members of a later generation within a leprous family were at times among those sequestered and sent off to Kalaupapa. However, the Kalaupapa containment had not reduced leprosy’s spread on the other islands. Based upon this information, the Hawai‘i Legislative Assembly concluded in 1873 that leprosy was not a contagious concern, and they attempted to reverse their earlier decision and vowed to send no more people with leprosy to Moloka‘i\textsuperscript{49}. However, commercial interests prevailed as other authoritative figures within the Hawaiian community wished to keep people with leprosy out of sight from the \textit{malihini} (foreign observers) visiting Honolulu. These \textit{malihini} were, after all, the observers whose future financial investments would continue to bolster the economic growth of the islands.

In 1882, according to Harvard Professor of Dermatology, James C. White, the medical world had “almost universally” adopted the opinion that “leprosy is not contagious, and that it is endemic mostly because it is hereditary”\textsuperscript{50}. Although many medical authorities agreed with White’s claim, emphasizing that it continued to “appear in the descendents of […particular] families,” others argued that this finding alone “proves nothing \textit{a priori}, for the […] continuance [of a disease] among relations may [also] be used […] as the best evidence of its communicability by contagion”\textsuperscript{51}. George W. Woods, Medical Inspector of the U.S. Navy, purported that “all agree […] that leprosy is hereditary”, but heredity alone, he continued, “cannot account […] for its rapid dissemination”\textsuperscript{52}.

This “unquestionable doctrine” of leprosy’s hereditary character continued to be questioned. The “important point to be determined”, it was argued, is “the proof of [contagion], not the dis[proof] of [heredity]”. Maintaining this secluded population of leprous patients allowed physicians during the last two decades of the nineteenth century to use Kalaupapa as an experimental study site from which they hoped to ascertain the precise hereditary underpinning of leprosy. Hawai‘i provided the case study site whereby the “recent introduction of leprosy into an insular nation” and the sequestration of most of those with the disease into a further isolated

\textsuperscript{48} Daws, 1973, p. 63. 
\textsuperscript{49} Osorio, 2002, p. 177. 
\textsuperscript{50} White, 1882, p. 435. 
\textsuperscript{51} Ibid. 
\textsuperscript{52} Woods, 1887, no pagination. Hagen (1886, p. 89) made similar claims.
community provided “that virgin field for observation so essential for the proper study” of the transmission of leprosy53.

Much was at stake over the Kalaupapa findings regarding leprosy. On one level, marriageability between people with leprosy as well as between individuals from ‘clean’ and ‘unclean’ families depended upon these observers’ conclusions. On another level, the entire usefulness of the settlement was in question. One figure at the center of this question was George Fitch. It was Fitch who, in 1882, had become Hawai‘i’s greatest proponent of drawing the interconnections between leprosy and syphilis. Leprosy, he argued, was the fourth stage of syphilis. His view, according to one observer, became “quite a popular topic of discussion amongst the laity and the medical fraternity in Honolulu”54. It also exacerbated the already present diagnostical dilemma that existed between these two disorders.

Fitch drew upon the findings at Kalaupapa as well as upon authoritative reports from around the globe for his 1884 Report to the Board of Health. He construed the information in this report as thoroughly supportive of a hereditary transmission of leprosy. “There appears no more need […] for restricting the liberty of lepers” by sequestering them in perpetual quarantine at Kalaupapa than for “restricting the liberty of those with the gout”. Segregation, he continued, “except in so far as it prevents [the] hereditary transmission of the disease, has absolutely no effect towards checking it”55.

Going against the tide, though unsupported in his belief, was the dermatologist James White. His view was based upon the observation that just as in the case of the “syphilization” of Hawai‘i, leprosy appeared on the islands far too quickly for it to be exclusively caused by heredity. For if heredity was acting as the only factor, he argued, “it would have required several generations to have accomplished such results”56. Additional opposition to the long-standing belief in the hereditary spread of leprosy in Hawai‘i came from the finding that no word existed in the Hawaiian language for this disease. Nor could, as Morell Mackenzie argued, “ancestral proclivity” alone explain the “sudden outbreak of the diseases [across the globe] in races [that were previously] altogether free of it”57. Also going against the tide were the

53 White, 1882, p. 435.
54 Mouritz, 1916, p. 54.
56 White, 1882, p. 438.
57 Mackenzie, 1889, p. 938. For an elaborate contemporary description of specific global sites affected by the recurrence of leprosy, see Tebb, 1893.
Hawai‘i-based physicians, Eduard Christian Arning and Arthur Mouritz. Arning, a highly skilled bacteriologist, arrived in Honolulu in late 1883 from Germany. Mouritz, an Oxford-educated physician, came to Hawai‘i and served as a resident physician and Medical Superintendent to the Leper Settlement at Kalaupapa from 1884 to 1887.

Arning acknowledged that a “disposition” to leprosy, a “certain weakness to resist its attacks”, may “possibly be transmitted by heredity”, but he remained firm that “leprosy itself was not congenital”. In 1884, he designed an experiment that would, he argued, prove once and for all, that leprosy could also spread via contagion. This involved the inoculation of a condemned prisoner, Keanu, whose sentence the Hawai‘i Privy Council commuted from hanging to life imprisonment so that he might serve as a subject for Arning’s experiment. Keanu, a strong man who showed no signs of leprosy or other illnesses, had the leproma (a leprous filled swelling) that had been removed from a young leper colony resident sutured over an incised site on his forearm. Prior to the inoculation, Arning made “a most searching inquiry as to any leprous taint in [Keanu’s] family”, and he found none. Arning removed material from Keanu’s body near the inoculation site over a number of months for microscopic observation. To his great disappointment, no bacterial signs of leprosy were found nor did Keanu develop any visible signs of leprosy before Arning returned to Europe in 1886.

The resident Kalaupapa physician, Mouritz, watched over Keanu after Arning’s departure and, a year later, diagnosed him as a “confirmed leper”. Arning presented this case at the First Congress of the Society of German Dermatologists held in Berlin in 1889. Shortly thereafter, however, doubts over Arning’s findings surfaced. Leprosy was, it was noted, endemic in Hawai‘i, and, as Mouritz argued, some of Keanu’s relatives were also known to be inflicted. Moreover, Mouritz had not succeeded in any of over a hundred similar attempts to inoculate healthy Hawaiians with the disease.

Arning’s later writings show more than disappointment. Although he had once viewed Hawai‘i as a natural laboratory for the study of leprosy, he

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60 Keanu’s familiar linkage to this disease was also raised by another resident physician at Moloka‘i, Sidney Bourne Swift, in Tebb, 1893, pp. 127-128.
now saw it much differently. For in Hawai‘i, “the intense feeling which everything connected with leprosy necessarily evokes in so small and terribly afflicted [a] community, cannot favour the slow and tedious process of purely scientific work”. And, no small obstacle in and of itself, in Hawai‘i, one also had to contend with the “character of the natives”.

Concern mounted on all sides of leprosy’s etiology for the remainder of the century. Foreign dignitaries and visitors, such as M.G. Bosseront d’Anglade, Commissioner and Consul of France, noted in 1893 that there are “very few native families who are not affected” with leprosy – both the disease and its stigmatization – as well as by the separation of their family members to Moloka‘i. In his travelogue, he admitted his inability to absolutely ascertain whether leprosy was contagious. The “combination of two conditions appears necessary for leprosy to develop”, he concluded. First, “prolonged contact with other affected persons”, and second, “individual susceptibility to disease”. The susceptibility, he argued, was seemingly inherited. He cited an example of the inherited transmission of this susceptibility in the case of a “healthy Kanaka man who during ten years at the [leprosy] settlement had successively married four women patients, [and] begotten leprous children by each of his wives, and yet never gave any indication that he himself had become a leper”. Thus, for many, as for Bosseront d’Anglade, the ambivalence over what precisely guided leprosy’s spread kept the matter controversial for some time.

It should be noted that by the century’s end, heredity had been eclipsed by contagion as the chief explanation for Hawai‘i’s leprous population. However, this turnabout likely resulted as much from politics as from medicine. New immigration channels would be opened if Hawai‘i was formally annexed to the United States. Fear of exporting leprosy together with coolie labor loomed, reaching unprecedented levels in California in 1897. Then, as U.S. public health and immigration authority Prince A. Morrow argued, considering that “more than ten percent of the Hawaiian race are affected

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62 Arning to Nathaniel Emerson, 10 May 1886, as cited by Daws, 1973, p. 278. Keanu was retained at Moloka‘i, a “punishment”, according to California University pathologist, D.W. Montgomery, that was “ten times more severe than the death penalty”. Physician William Jelly concurred, noting “had [Keanu] known what leprosy is, [he] would without hesitation, have preferred the guillotine, the garrote, or the hangman’s noose” to his fate in Kalaupapa; see Tebb, 1893, pp. 124-135.


with leprosy”, he conjectured that “it becomes a serious question as to what
will be the effect of the absorption of this tainted population upon the health
interests” of the United States if the islands are annexed to them65. The
Hawaiians themselves are not the real problem, he argued, for each of them
is “essentially insular in his tastes and habits and shows little disposition to
leave his native shores”. Rather, it is the labor forces, having interbred with
the native Hawaiians, who are the likely ones to carry the “seeds of […]this
deadly contagion [i.e., leprosy]” with them when imported to the Western
shores of the United States66. “All of these facts”, he concluded, “should be
carefully considered and their importance from a sanitary point of view
carefully weighed by our legislative authorities before deciding upon the [U.S.]
annexation of Hawaii with its leprous population”67.

Hawaiian sovereignty came to a close soon after the Newlands U.S.
Congress Joint Resolution of Annexation, further binding the Hawaiian Islands
to the U.S. on 7 July 1898. Political turmoil had begun with the overthrow of
the Hawaiian Constitutional Monarchy in 1893 and the establishment of a
self-designated provisional government to oversee the new U.S. protectorate.
It remained strong through the time when the pro-expansionist U.S. President,
William McKinley, ushered in the annexation bill. “Among the early results
of annexation”, the physician Burnside Foster argued, will “undoubtedly be
a largely increased immigration to as well as emigration from the islands”.
Many who “either know or suspect that they have [leprosy] will undoubtedly
escape to this country while those from this country who settle in Hawai‘i will
be thrown into more or less intimate relations with the already infected but
unrecognized lepers”. Thus, it would “certainly seem worthwhile”, Foster
continued,

for the United States to take this question immediately at hand, and to appoint
a commission of bacteriologists properly equipped and with every facility
for the study of the leprous problem. England has gained the eternal gratitude
of humanity for her Jenner and her Lister, France for her Pasteur, Germany
for her Robert Koch. Shall not America […] gain further glory by striking
leprosy from the calendar of human afflictions68

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65 Morrow, 1897, p. 582.
66 Ivi, p. 588.
67 Ivi, p. 590.
68 Foster, 1898, p. 305.
Tuberculosis

Divergent thoughts existed surrounding the hereditary nature of tuberculosis during the 1800s. Medical authorities who purported this “white plague” to be hereditary offered as evidence its frequent appearance in multiple members and successive generations of the same family. Some argued that “from the beginning of medical time it was considered that tuberculosis ran in families; that heredity had much to do with the occurrence of the disease.” Prominent Boston medical authority, Henry I. Bowditch wrote to a general reading audience in 1869 that “Undoubtedly it is true that public opinion considers consumption [i.e., tuberculosis] as hereditary, and medical experience seems to support this view. We presume that there is scarcely a physician anywhere who would not admit the truth of this belief”. Yet, he adds, “no physician would dare to say that […] consumption would necessarily be transmitted from parent to child”.

However, Robert Koch’s 1882 discovery of a bacillary germ that he deemed the etiological agent responsible for tuberculosis provoked serious rethinking about this disease among the medical community and the general populace. According to biomathematician and eugenicist Karl Pearson’s later reflections, following Koch’s discovery, the “idea of infection dominated” and consequently, an “immediate neglect” arose regarding any reputed “hereditary factor” underlying this disease.

Although it is true that news of Koch’s discovery “immediately” spread throughout the globe, we are only beginning to fully appreciate that his pronouncement did not immediately convert all ‘hereditarians’ into supporters of the germ theory. Indeed, many physicians, especially older physicians, remained skeptical of any germ-based etiology, and they continued to practice believing tuberculosis to be hereditarily transmitted. When confronted with findings suggesting that they disregard heredity as the primary cause of tuberculosis, they typically replied with something like the following argument.

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69 Keers, 1978, p. 53, reviewed these proponents’ beliefs. Additional supporters of a hereditary passage of tuberculosis are found in Castiglioni, 1933.
71 Bowditch, 1869, reprinted in Rosenkrantz, 1994, p. 63.
72 Pearson, 1912, p. 3.
73 Worboys, 2001, pp. 81-100; Carter, 2003, p. 196.
74 Ott, 1996, p. 28. Additionally, see Wilson, 2006, pp. 19-37.
How can we account for the cases where the parents, having died of Consumption, the children are necessarily attacked on arriving at a certain age, with a severe type of the disease? And, moreover, there are several instances [...] where the children, who happened to be scattered in various parts of the world, were yet attacked and succumbed to the fell disease at almost the same age?75

However, the hereditarians were divided over precisely what they deemed to be heritable regarding tuberculosis. Whereas a large faction had once argued that “the disease” itself was inherited, many physicians began to assert during the late 1800s that it was something about this disease that was inherited. In other words, a hereditary tendency, predisposition, or diathesis to disease existed76. Diathesis, the term commonly used at this time, referred to the “inherent liability to consumption which ‘ran in families’ and was handed down from one generation to another”77. Indeed, the extent to which the germ theory predominated medical thought regarding tuberculosis during this period remains unresolved.

In Hawai‘i, tuberculosis was found in successive generations of missionaries, natives, and chiefs78. There, it “vied with syphilis” as the “singularly most remarked upon disease [...] during the first half of the 19th century”79. However, as the century progressed, tuberculosis had come to overshadow the other two diseases of “the destructive trinity” such that it remained in “almost full possession of the field”80.

When we look to Hawai‘i during the two decades following Koch’s discovery, we find the most vocal support for a hereditary transmission as the primary explanation of tuberculosis among the island population. Such support was not dissimilar to that expressed in Euro-America. Contrary to hagiographic claims that hailed the rapid ascent of bacteriology, support of heredity as a key etiological underpinning of tuberculosis – and of syphilis –

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75 Williams, 1882, p. 618.
78 Middleton, 1971, p. 452.
80 Mouritz, 1916, p. 58. This finding is remarkable considering that in the mid-1800s, several physicians noted the Hawaiian’s “entire exemption from pulmonary tuberculosis”, see Gulick, 1855, p. 197.
persisted well into the twentieth century. What appears to be peculiar to the Hawaiian representation of tuberculosis, however, is that their discussion of this disease typically paralleled that of leprosy. The connection between these two diseases was not, in their view, merely coincidental. Considerable clinical conundrums arose because leprosy, at least in its early forms, mimicked the signs of tuberculosis. Some physicians even regarded the ‘tuberculosa’ or the ‘tuberculous condition’ that formed on the face, legs, arms, and trunk of people with leprosy as affiliated with an inward pulmonary tuberculosis. However, over time, the manifestations of leprosy became more distinguishable and did not involve the lungs.

Tuberculosis also held a particular relationship with syphilis on the islands. It was widely believed that an individual demonstrating “defects of development” or having parents whose diseases “stamped sufficient weakness upon their offspring” frequently gave rise to children with a diminished resistance to tuberculosis. Prominent among such parental-derived diseases was syphilis.

And again, as seen in beliefs about syphilis and leprosy, those determined to Christianize the Hawaiian islands integrated Biblical wisdom with medical reports. Dr. Bowditch provided Hawaiian missionaries considerable support through popularizing tuberculosis as follows. It is often seen that the diseased conditions of the parents, sometimes, alas! Due to their own or to their ancestors’ previous excesses, create tender bodies of newborn children […] so tainted that life becomes a burden. We have often seen in such tuberculosis cases the terrible vindication of the power of the old Mosaic law, ‘For the sins of the fathers are visited upon the children […] unto the third and fourth generations’.

One additional connection may be gleaned regarding tuberculosis and inheritance in the Hawaiian Islands. King Lunalilo’s tuberculosis brought an end to his reign in 1874, only thirteen months after Hawaiians elected him King upon the death of Kamehameha V. Between the time of his death and the U.S.’s takeover of control of the Hawaiian Islands, the hereditary lineage of rulers successively lost ground. Interestingly, it was over this same time period that tuberculosis became a major health concern.

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81 Kneeland, 1873, pp. 404-405; Tryon, 1883, p. 447.
82 Although sanitariums were developed on four of Hawaiian Islands, tubercular patients admitted themselves voluntarily. They never suffered the stigmatization commonly felt among the leprous patients.
84 Bowditch, 1864, p. 65.
that the Germ Theory fought to overtake hereditary beliefs in the transmission of diseases. Perhaps the end of hereditary rule in Hawai‘i parallels, in ways that have yet to be uncovered, the transference of power from the hereditarians to the germ theorists regarding disease.

**Hawaiian Highlights Expanding Our Perspective of Hereditary Disease**

The current quest for better understanding the hereditary nature of particular diseases is hardly new. Considerable attention has been directed towards the meaning of heredity in relation to disease within the context of Europe, England, and the United States. However, the extent to which these beliefs changed elsewhere around the globe and whether this change was concurrent with that in Euro-America has been little explored.

Perhaps Hawai‘i is marginal and remote to many cultural worldviews, both then and now. However, reflecting upon Hawaiian culture reminds us that some 19th-century folk and physicians there viewed ‘heredity’ and ‘inheritance’ somewhat distinctly from concurrent views expressed in Euro-American writings. For example, long before Westerners sought to identify the hereditary substance within humans, Hawaiians already envisioned a spiritual power, *mana*, as a contributory factor to health and disease. If, for example, the flow of *mana* was disrupted, disease would likely follow. Although *mana* could be acquired within one’s lifetime, many Hawaiians also believed that it could be passed hereditarily. In addition, spirits, ghosts, wraiths, and astral bodies are ancestral, and thus, as Hawaiian heritage reminds us, their influence must be considered in discerning a culture’s view of heredity as an etiological factor of disease. Incorporating the perspective of heredity from earlier Hawaiian cultural perspectives adds a further dimension to our worldview of beliefs about the inheritance of disease.

Expanding research into these and related areas will allow us to recapture more about the entire spectrum of illness and health as viewed by Hawai‘i’s *ka po‘e kabiko* (the people of old). Such views can complement and strengthen the Western-centered narratives that have dominated decades of the telling of Hawai‘i’s past. This focus upon Hawai‘i also exemplifies our need to be aware that specific cultural contexts drive specific and precise meanings into such polysemic words as ‘inheritance’ and ‘heredity’. It reminds us of the

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85 See, for example, Rushton, 1994; Rosenberg, 1974; and Wilson, 2002a.
86 Wilson, forthcoming.
need to consider comparative cultural views, as well as to seek reasons underlying local and regional nuances in the expression of meaning as we seek to better understand the variety of conceptualizations that heredity appears to have held during earlier periods\(^{87}\). It can also prompt further studies to determine just how contemporaries of the 19th century viewed immigration and racial mixing as altering, perhaps exacerbating, hereditary influences upon disease within these new mixes of peoples in Hawai’i.

\textit{Riassunto}

Dopo la morte del sovrano hawaiano Kamehameha IV nel 1863, fino alla sconfitta del \textit{Home rule Party} nel 1902, le Hawaii furono teatro di duri scontri con poteri esterni in merito alla successione ereditaria dei loro governanti. Fu inoltre in questo periodo che alle Hawaii vennero formulate nuove ipotesi sull’eredità di particolari malattie. Le tre malattie studiate in questa sede, che erano frequenti in quel periodo tra gli hawaiani e gli euroamericani, sono la sifilide, la lebbra e la tubercolosi. Viene rivolta una particolare attenzione all’ampiezza e al momento storico in cui le concettualizzazioni ereditarie di queste malattie vennero messe in discussione dalla teoria dei germi, una spiegazione delle malattie che trovò ampio consenso almeno in alcune regioni dell’Europa e degli Stati Uniti durante la seconda metà del XIX secolo. Le fonti da cui sono state tratte le informazioni sulle malattie presenti nell’arcipelago hawaiano sono pubblicazioni di referti medici e relazioni sulla sanità pubblica; racconti di pazienti; studi etnografici; resoconti di spedizioni scientifiche; diari di viaggio e saggi storici sulla medicina tropicale e su popoli razze e culture. Questo saggio fornisce ulteriori interpretazioni dei modi in cui gli equivalenti inglesi del termine ‘eredità’ – \textit{inheritance} e \textit{heredity} – furono applicati ai diversi stadi della malattia, all’interno di differenti prospettive culturali presenti nel mondo, durante questo periodo cruciale di mutamenti nei concetti di eredità.

\textit{Keywords:} hereditary disease, Syphilis, Leprosy, Tuberculosis

\textit{Running head:} Hereditary Disease in 19th - C Hawai’i

\(^{87}\)Tobin, 1994, pp. 65-92. Cultural anthropologist George M. Foster provided timeless reminders to historians of the need to be ever cognizant of the comparative ethnographical contexts when pursuing historical work regarding “other” cultures. See Foster, 1976, pp. 773-782.
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