

# Toward an Inventory of Ahupua‘a in the Hawaiian Kingdom: A survey of Nineteenth- and early Twentieth-Century Cartographic and Archival Records of the Island of Hawai‘i

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## INTRODUCTION

The Hawaiian land tenure system was an immensely productive and complex. The system utilized a range of land divisions to maximize resources and productivity of diverse ecosystems while connecting people and their social systems to place. There has been much work on the formations of and nature of this system,<sup>1</sup> which has enriched contemporary understandings of the functions and innovations

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made in Hawaiian land tenure over time. This paper builds off those works and offers one attempt at quantifying ahupua'a divisions in the Hawaiian Kingdom. We also discuss some of the unique qualities and variations of ahupua'a divisions while offering our detailed study of the island of Hawai'i as an example.

We begin with a brief discussion of the origins and nature of ahupua'a and other Hawaiian land divisions. We then explore how the system evolved during the nineteenth century, and how this process of evolution gave birth to a wealth of cartographic and archival documents. These sources can be used to identify most of the ahupua'a of the Hawaiian Kingdom and are the foundation on which our attempt at a comprehensive quantification and qualification of ahupua'a throughout the archipelago is built. We also briefly discuss some local variations in ahupua'a. However, due to page limitations we focus most of this discussion on the largest of the Hawaiian Islands. Finally, we offer our explanations on why some ahupua'a names were removed from use on maps throughout the nineteenth and twentieth centuries.

#### THE NATURE OF AHUPUA'A

As anthropologist Marion Kelly explains in her 1956 dissertation, "[h]igh islands in Polynesia are characterized by generally piecemeal land divisions which radiate from the interior uplands, claim a deep valley, and extend seaward past the shoreline," an assessment also made by geographer Gerard Ward.<sup>2</sup> The concentric geography of high volcanic islands imposes a system of wedge-shaped sections that allow for a functional and logical way of creating boundaries. Examples of such land divisions encompassing a small community of inhabitants and running from the mountains to the sea can be found throughout the high islands of tropical Polynesia and Micronesia.

As land units also generally running from the mountains to the sea, Hawaiian ahupua'a were geographically similar to land divisions on the other high volcanic islands. However, comparative studies of Polynesian land tenure and social organization clearly show that the various islands had developed in different directions of socio-political evolution. Two Polynesian societies, Hawai'i and Tonga, had evolved from tribal, kin-based systems of social organization and land tenure

to centralized states with feudal-like systems of land tenure, while Tahiti was somewhere in the middle of an evolution between the two.<sup>3</sup> Hawaiian ahupua‘a were thus similar geographically to land units in the traditionally organized Polynesian islands, but had a different socio-political function. While the land units in other islands were social-familial, they were that and territorial in Hawai‘i. A linguistic analysis of the word ahupua‘a, a Hawaiian innovation not cognate to any land division term in other parts of Polynesia, shows its purpose as unit for offering tribute to a centralized government, referring to an ahu [altar] decorated with the head of a pua‘a [pig] situated at the boundary of the land section, upon which tribute for the island’s ruler and ho‘okupu [offerings to make lands productive] would be deposited during the annual makahiki ceremonies.<sup>4</sup> Unlike chiefs heading clans and their territories in traditional Polynesian societies, Hawaiian ahupua‘a were administered by konohiki, resource managers appointed by the ruler of large districts or entire islands.

According to Hawaiian traditions, the system of ahupua‘a divisions was created by rulers who unified or centralized governance of their respective islands, such as Mā‘ilikūkahi oŋ O‘ahu and ‘Umi on Hawai‘i Island. Historian Samuel Kamakau describes Mā‘ilikūkahi’s reforms as follows:

I ka noho Aupuni ana o Mailikukahi, Ua noho huikau ka aina; aole maopopo ke Ahupuaa, ke Ku, ka Iliaina, ka Mooaina, ka Pauku aina a me na Kihapai. Nolaila, kauoha aku o Mailikukahi i na ‘Lii me na kaukualii, me na puali alii a me na Luna, e Mahele i ka aina i moku, a me na Ahupuaa, a me na kupono me ka Iliaina a me na Mooaina a puni o Oahu—Eono moku. Eono alii nui Aimoku; a hoonoho aku la ia i na‘lii i Ahupuaa, he Ahupuaa nui, he alii nui, he kaukualii, he kupono ka aina, he puali, he Iliaina—Haawiiia ka aina i na makaainana a pau loa, a puni o Oahu.<sup>5</sup>

During the reign of Mā‘ilikūkahi the land was in a state of confusion. It was not clearly understood what was an ahupua‘a, a kū, a ‘ili ‘āina, a mo‘o ‘āina, a paukū ‘āina and a kihāpai. Therefore, Mā‘ilikūkahi ordered the chiefs, the lower chiefs, the warriors and the overseers, to divide the land into moku, ahupua‘a, (‘ili) kūpono, ‘ili ‘āina and mo‘o ‘āina all around O‘ahu. There were six moku. There were six high chiefs ruling over each moku; and he established the chiefs to rule over the ahupua‘a; for a large ahupuaa, a high chief; for a lower chief the

land was a ('ili) kūpono; for a warrior, a 'ili 'āina. Land was also given to all of the maka'āinana throughout O'ahu.

Despite the obvious innovation involved in creating ahupua'a, their striking similarity to land sections in non-feudally organized Polynesian islands makes it likely that geographical outlines of many ahupua'a originated in similar kin-based land units that existed before the centralizing ali'i reorganized the system. For the larger land districts (moku or kalana, encompassing many ahupua'a each) this seems to be even more clear.<sup>6</sup>

Besides ahupua'a and moku/kalana, there were many other units of land division. As we have seen in the quote by Kamakau above, ahupua'a were further subdivided into 'ili, which in turn consisted of smaller plots called mo'o, paukū and kīhāpai. The older Hawaiian historian Davida Malo enumerates even smaller divisions, namely kō'ele, hakuone and kuakua.<sup>7</sup> On the intermediate level, some kalana/moku were subdivided into 'okana, some 'okana were apparently independent of any moku/kalana, and moku and kalana were not always synonymous but appear in some cases to have been units nested within each other.<sup>8</sup> Despite the diversity and complexity of the system, it appears that the ahupua'a became the most important division in the resource administration of the Hawaiian Kingdom, both as a unit and as a reference for the location of smaller properties.

#### EARLY HAWAIIAN MAPS

Traditionally, knowledge about land and land divisions was recorded mentally and orally. Mapping in the sense of producing a scaled representation of the landscape started with the first European explorers such as Captain James Cook. However, As Fitzpatrick and Mofatt argue<sup>9</sup>, these early explorers only documented the coastline and features important from a visiting ships' point of view, such as anchorages and harbors, and did not document Hawaiian land divisions. However the names of the six moku divisions of Hawai'i Island were recorded on the very first map drawn by Captain Cook in 1778 as well as another one by George Vancouver in 1790.<sup>10</sup> A more systematic cartographic representation of Hawaiian land divisions from within the shores begins with the work of missionaries William Ellis

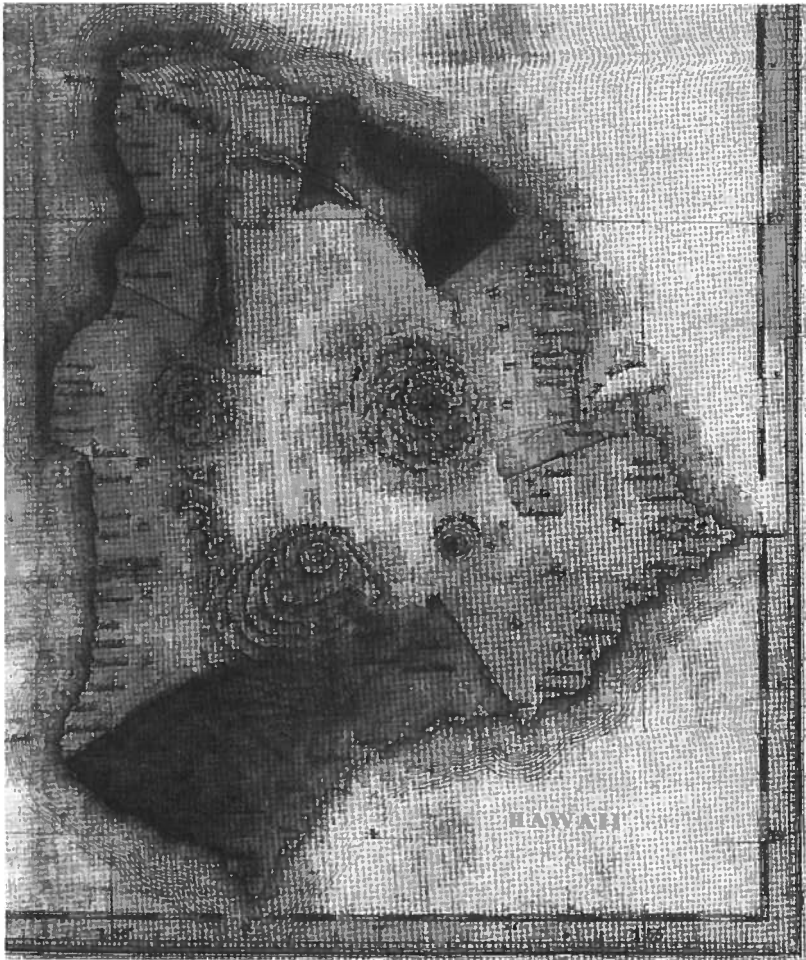


FIGURE 1. Portion of 1838 *Map of the Hawaiian Islands* by S. P. Kalama, showing Hawai'i Island.

and Ursula Emerson in the 1820s and 1830s.<sup>11</sup> Their work was continued by 'ōiwi Hawaiian surveyors, and culminated in the publication at Lāhaināluna, first of a small monochrome map of the archipelago in 1835, of which only sections survive,<sup>12</sup> and then of a monumental colored map of the archipelago by Hawaiian surveyor and government official S. P. Kalama in 1838 (fig.1).<sup>13</sup>

## THE MĀHELE OF 1848 AND RELATED DOCUMENTS

During the nineteenth century, the Hawaiian land tenure system underwent a complex process of changes, which have been extensively described and commented upon by a variety of authors.<sup>14</sup> As such, we merely provide a summary here in order to provide some context for the evolutions of the land tenure system during the Māhele process. Most important, however, in the course of these changes various maps and land lists were created which are essential primary sources for the identification of ahupua'a names and boundaries.

In 1845, a Board of Commissioners to Quiet Land Titles (Land Commission) was created, initially to confirm or reject claims to land made by private parties who had received oral deeds of land outside of the traditional tenure system. Secondly, the rights in the land, controlled by the Mō'ī (King) but owned by the Mō'ī, the Chiefs and the people in common, were divided out in several steps. First, in early 1848, the Mō'ī and 252 konohiki of various chiefly rank holding land under him quitclaimed the lands between each other, and the Mō'ī subsequently turned over the larger parts of his share to the government. This series of transactions that became known as the Māhele and was recorded in the *Buke Kakau Paa no ka Mahele aina i Hooholoia iwaena o Kamehameha III a me Na Lii a me Na Konohiki ana* (Māhele Book).<sup>15</sup>

Listing 1,124 names of ahupua'a and 429 names of 'ili, the Māhele book is a foundational source for compiling an inventory of Hawaiian Kingdom ahupua'a.<sup>16</sup> Based off of this source, as well as his own original research, the Hawaiian surveyor C.J. Lyons estimated the overall number of ahupua'a to be around 2,000.<sup>17</sup> More recently, Riley Moffat and Gary Fitzpatrick have made an estimate of 1,800,<sup>18</sup> which comes close to our count of 1,825. The substantial discrepancy between the 1,124 ahupua'a listed in the Māhele Book and our estimate of 1,825 warrants explanation. One reason for this is that many ahupua'a are not individually named in the Māhele Book. Most of East Maui, for instance, is divided on the district level, and ahupua'a within these districts are therefore not named. An example can be found with Kaupō where it is mentioned that the district consists of 66 ahupua'a ("Kaupo, 66 ahupuaa, ka moku" to govt.), but this number is greatly inferior to a list of ahupua'a of Maui composed between

1846 and 1856 showing a total of 81 ahupua‘a in Kaupō.<sup>19</sup> Other examples in the Māhele Buke where ahupua‘a are listed in bundles include: Ko‘olau (“Koolau, Ka Moku” to govt), Hāna (“Na Aina Iloko o Hana” to V. Kamamalu), and Kahikinui/Kona (“ka moku” to govt), as well as for the island of Ni‘ihau where no ahupua‘a names or numbers are given. Besides these omissions of large numbers of ahupua‘a names, there is also evidence of the existence of more ahupua‘a names on the early, pre-Māhele maps. These maps show many land section names that are not in the Māhele Book. Some of these appear to be place names, not land sections, but many of them appear to be indeed ahupua‘a that for some reason became subsumed within others before the Māhele.

Through the Māhele of 1848 most ahupua‘a, as well as some ‘ili and in rare cases larger land divisions, became classified as konohiki, Crown, or Government lands. Shortly after the 1848 Māhele, the Hawaiian legislature passed an act listing the Crown and Government lands.<sup>20</sup> In order to prepare the list for the act, crown and government lands in the Māhele book were numbered in a system counting them clockwise around each island starting in each island’s Kona (Lāhainā for Maui), except for Kaua‘i, on which the count runs counter-clockwise. The clockwise direction is reminiscent of the direction the makahiki tax collection processed during the classical period. Because the Māhele was accomplished by chiefs relinquishing their former lands back to the Mō‘ī and then lands subsequently being awarded, ahupua‘a were not awarded in a sequenced fashion. The numbers that appear in the margins of the Māhele Book were most likely done after the Māhele in order to inventory the lands geographically, and at a first glance might seem erratic and obscure. In the 1848 act, however, lands were ordered according to geographic sequence, generally matching with the numbers in the Māhele Book (see fig. 2).

Konohiki claims from the Māhele Book would receive awards from the Land Commission making them parcels “ma lalo o ke ano alodio” [freehold less than allodial], which could be converted into “ano alodio” [allodial] titles upon paying commutation of a portion of the land’s value to the government and receiving a Palapala Sila Nui [Royal Patent] signed by the Mō‘ī. In many cases, commutation was paid in land, especially by high-ranking konohiki with a lot of land claims from the Māhele, so that several ahupua‘a or ‘ili declared

The image shows two pages from the 1848 Māhele Book. The left page is dark and mostly illegible, but faint numbers (1-10) are visible along the left edge. The right page is lighter and contains two columns of handwritten text. The left column lists Crown lands and the right column lists Government lands. The text is written in a cursive script and includes various place names and descriptions. Faint numbers (1-10) are also visible on the left side of the right page, corresponding to the entries in the left column.

FIGURE 2. Sample pages of the 1848 Māhele Book, listing Crown (left) and Government lands (right). Note the faint numbers on the left side of each column.

konohiki lands in the Māhele were turned over to become government lands.

Following the Māhele, some of the ahupua'a that were awarded as Land Commission Awards to konohiki were surveyed. These survey plats are either directly attached to the Land Commission Awards or filed separately as Registered Maps.<sup>21</sup> Most ahupua'a and 'ili, however, were awarded by name only, and the absence of surveys often led to property disputes. In 1862, Lot Kapuāiwa created the Boundary Commission in order to clarify the boundaries of those ahupua'a or 'ili by collecting testimony of knowledgeable kama'āina and creating



surveys based thereon.<sup>22</sup> Many of these boundary commission reports contain valuable information for the determination of ahupua‘a boundaries and the identification of obscure land division names.

The third stage in the Māhele process focused on defining the rights of and awarding lands to the kānaka or native tenants (i.e. maka‘āinana, hoa‘āina). All Land Commission Awards and Royal Patents, for both konohiki and private titles, as well as the crown and government titles in the Māhele Book, contain a variation of the clause “koe nae na kuleana o na kanaka” [reserving the rights of native tenants]. The maka‘āinana or hoa‘āina class, as one of the three estates of the Kingdom, retained their rights to the land until they divided out their interests. The 1850 Kuleana act provided mechanisms for such divisions to happen, and thousands of awards for small plots of lands were issued to hoa‘āina by the Land Commission accordingly. Furthermore, the act provided also for the purchase of government lands by native tenants, and over 100,000 acres were purchased that way.<sup>23</sup>

#### THE HAWAIIAN GOVERNMENT SURVEY

In 1870, Kamehameha V’s government created the Hawaiian Government Survey (HGS) in order to undertake a systematic cadastral survey of the country, which, during the following decades, produced many maps in various scales. These included general topographic information and a compilation of all available surveys of both konohiki and kuleana awards. Furthermore, the HGS also provided hydrographical surveys of the harbors essential for inter-island communication.<sup>24</sup> Two of the most prominent surveyors working for the HGS, Curtis J. Lyons and William D. Alexander, published important articles about Hawaiian land divisions, land titles, Polynesian comparisons, as well as the work of the HGS itself.<sup>25</sup> More than a hundred maps were produced and are on file today as Registered Maps at the State Survey Division. Most of these maps are available in digital form online.<sup>26</sup> On many of these maps, ahupua‘a names and boundaries are meticulously documented, making them essential sources for this research.

The HGS was at the cutting edge of its time. It was successful with the limited resources of the Kingdom while surveying extremely dif-

ficult terrain. Like the Kingdom's adoption of technologies such as electricity and the telephone, the HGS was even slightly ahead of its United States counterpart. The HGS employed the most advanced survey tool of the time. The newly perfected, twelve-inch theodolite of the London company Throughton and Simms, was used by the HGS several years before its American counterparts. Hawaiian Kingdom Surveyor-General Alexander proudly remarked this fact in his 1889 report.<sup>27</sup> Personnel of the HGS also participated in the emerging international system of scientific exchange among geographers. A Hawaiian delegation consisting of Surveyor-General Alexander and Privy Council member Luther Aholo (later to become minister of the Interior, 1886-1887) participated in the International Meridian Conference in Washington D.C. in 1884.<sup>28</sup>

While systematically surveying the national territory, the Kingdom government also published two land index books. The first was an index of Land Commission awards in 1881,<sup>29</sup> followed by an Index of Government Grants in 1886.<sup>30</sup> Since these indices indicate the ahupua'a name for the location of each LCA or Government Grant, they are useful resources especially for the identification of ahupua'a whose names and boundaries are not clearly indicated on maps. Furthermore, the files of the Kingdom's Interior Department and the Department of Land and Natural Resources (for the territorial period) in the Hawai'i State Archives contain many unpublished lists of lands. These include lists of government, crown, and konohiki lands of various districts. Of particular interest is a list of "unassigned lands", i.e. lands omitted in the Māhele (and for the most part presumed to be government lands) that was prepared by surveyor-general William D. Alexander in 1888.<sup>31</sup>

What is most impressive of the sources created by the Hawaiian Kingdom government, including Land Commission Awards, surveying and mapping, as well as the reports of the Boundary Commission, is that all of this work, despite the modern technologies employed, was based on traditional knowledge of land divisions and their boundaries (see fig. 3). Land tenure reorganization and surveying in the Hawaiian Islands during the nineteenth century was quite unusual in that native systems of spatial organization were not over-written by a colonizer, as it was done in most parts of the Americas, Australia, and Aotearoa [New Zealand] as well as important sections of Africa and

Asia. Instead, what happened was a selective appropriation of western technology by native leaders to pursue their own goal of building a modern nation-state.<sup>32</sup> Surveying in the Hawaiian Kingdom is thus to be understood as a translation of mental mapping onto paper maps, strikingly similar to the recent mapping project carried out in collaboration between native experts and foreign anthropologists on the isolated Polynesian island of Anuta.<sup>33</sup>

#### POST-1893 MAPS AND LAND INDICES

After the American invasion and occupation of the Hawaiian Kingdom in 1893,<sup>34</sup> the mapping enterprise of the HGS continued without major interruption, and more maps and updates of earlier maps were produced in the last decade of the century. Under the US territory the HGS was renamed the Hawaii Territory Survey (HTS), which further continued the work. By the 1910s, the long-term goal of the HGS of producing a small-scale cadastral survey of the entire country was essentially complete. In some cases, the post-1893 HGS and HTS maps that build off of HGS maps of the Kingdom provide clarifications of ahupua‘a names and boundaries that are not found on earlier HGS maps.

Under American rule, various US federal agencies also began mapping the islands, the most important being the United States Geological Survey (USGS), which by the 1930s had completed a small-scale topographic survey of the archipelago that has since been periodically updated to become today’s USGS series of topographic quads.<sup>35</sup> While the information on ahupua‘a names and boundaries on these maps need to be consulted with caution,<sup>36</sup> USGS quads can be helpful to clarify the topographic shape of ahupua‘a, especially as relating to watersheds (see below) because most HGS and HTS maps lack clear topographic features.

In 1903, William D. Alexander, in his new capacity as local head of the US federal Coast and Geodetic Survey in Hawai‘i, compiled and published a list of Hawaiian Geographic Names, presumably a compilation of all available manuscript archival resources then available.<sup>37</sup> This list appears to be the most comprehensive for the archipelago at large, containing multiple ahupua‘a names not included in any other published document or on any available map, and has

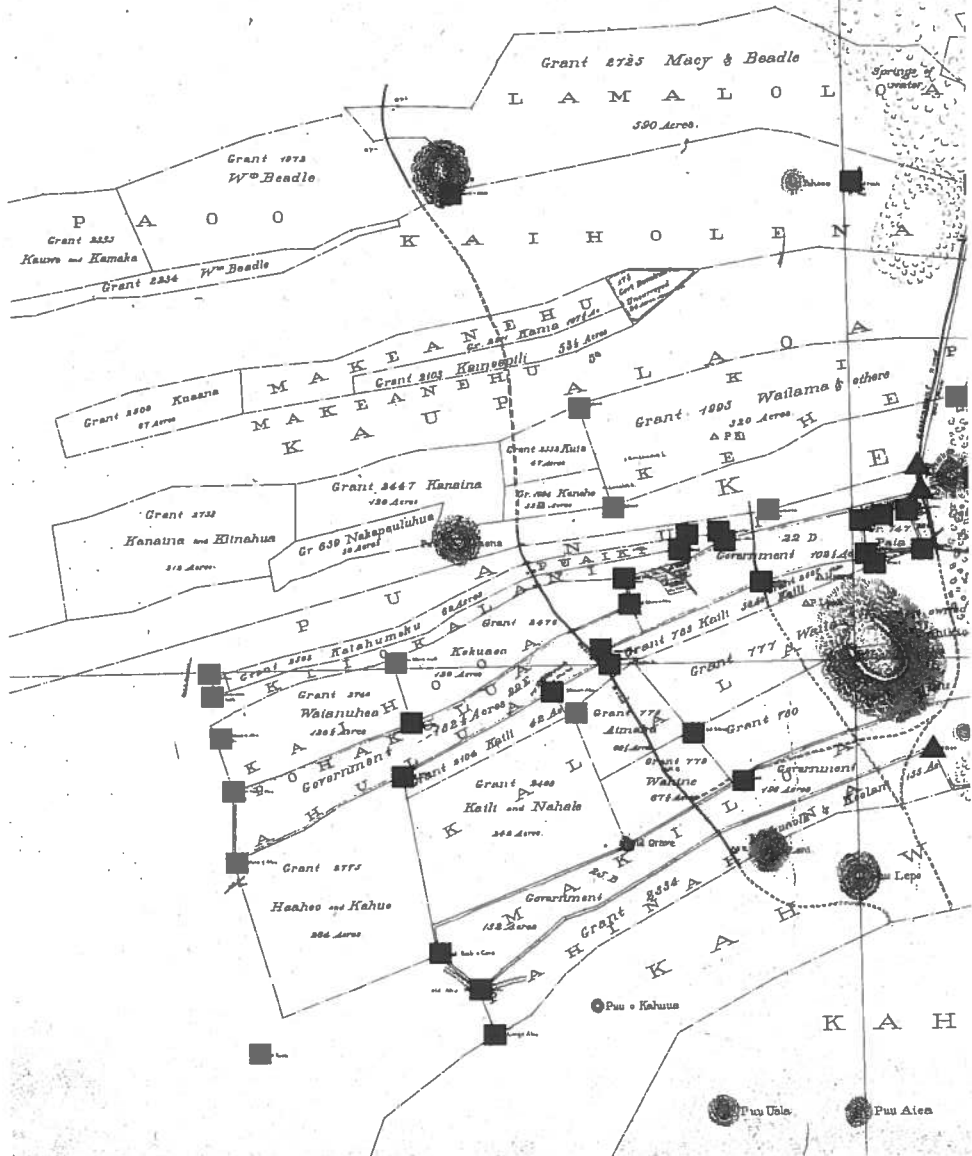


FIGURE 3. 1887 HGS map of Lāhikiola in central North Kohala, Hawaii'i Island (Reg. 1212). Note the traditional boundary markers (symbols enlarged and modified by the authors).

# MAP OF LAHIKIOLA DISTRICT KOHALA HAWAII

Showing Government Lands

Scale 1000ft - 1 inch

J. S. Emerson Surveyor Nov & Dec 1887

➔ Boundary points actually located and marked on the ground are represented thus :

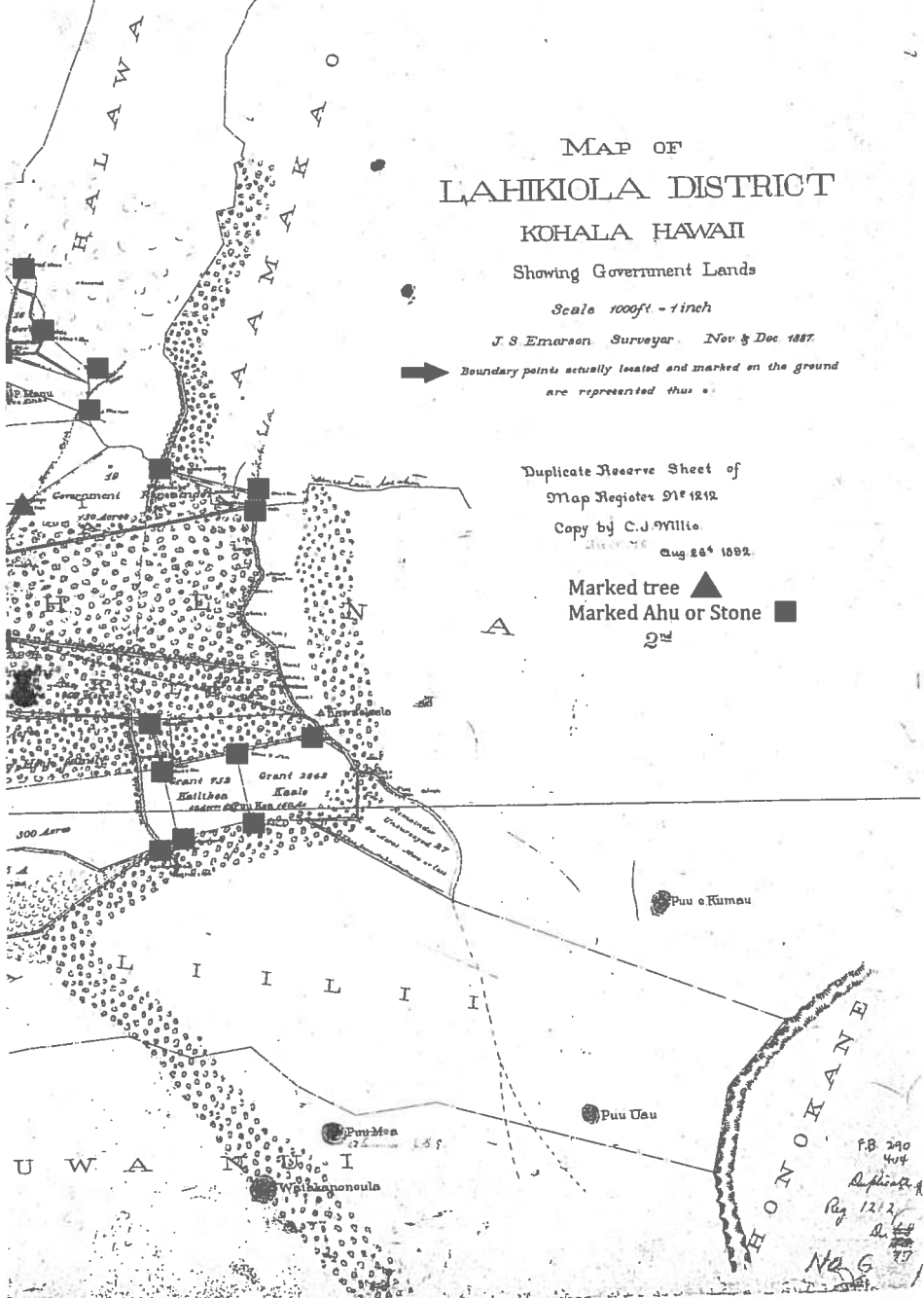
Duplicate Reserve Sheet of  
Map Register 91<sup>o</sup> 1212

Copy by C. J. Willie

Aug 26<sup>th</sup> 1892.

Marked tree ▲  
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2<sup>nd</sup>



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thus been an essential resource for compiling our inventory. Later, in 1929, the territorial government published an extended and more complex index of LCAs, ordered by name of awardee, location, LCA number and Royal Patent number.<sup>38</sup> This is a very useful tool for the identification of kuleana awards, which in turn can be helpful in identifying ahupua'a or 'ili names not found anywhere else. Finally, the University of Hawai'i Press published *Place Names of Hawaii* in 1974,<sup>39</sup> compiled from many different sources, which contains most of the ahupua'a names of the 1903 list, but also many place names that in a few cases were helpful to identify elusive ahupua'a names.

#### CHANGES IN ORGANIZATION OF LAND DIVISIONS

Paralleling other bureaucratic states in the nineteenth century, the land division system of the Hawaiian Kingdom was standardized and rationalized during and after the Māhele process. While traditionally, the land division system was complex and varied from place to place as will be explored in more detail below, the standardized three-tiered system of moku/kalana, ahupua'a, and 'ili ended up being implemented everywhere. Following the Māhele, the use of kalana became less frequent and was increasingly replaced with that of moku. In some areas, new moku were created where none existed before. For example, on West Maui, which had probably the most complex and divergent system, the 'okana (or kalana?) of Kahakuloa was integrated into the moku of Ka'anapali; the two 'okana (or kalana, or independent ahupua'a?) of Olowalu and Ukumehame were integrated into the moku of Lāhainā; and a new moku named Wailuku was created to incorporate four or more formerly independent ahupua'a (earlier referred to as Puali Komohana, Nā Poko or Nā Wai Ehā).<sup>40</sup> On East Maui, the three moku (or 'okana?) of Hāmākuapoko, Hali'imaile, and Makawao (each containing multiple ahupua'a) were each relegated to ahupua'a status and merged to form the moku of Hāmākuapoko. However, despite this formal rationalization, some areas retained a certain ambiguity in both the title granting process and on the maps created by the Hawaiian government survey.

Furthermore, for administrative purposes, the system was further rationalized through the creation of better manageable districts by merging smaller moku (like those on Maui) and dividing larger ones

(like those on Hawai'i). On Maui, for example, Kahikinui, Kaupō, Hāna and Ko'olau were merged into Hāna district, while on Hawai'i, Kona and Kohala were split into North and South Kohala and North and South Kona.<sup>41</sup> The new districts were used for general administrative, school, judicial, and electoral purposes, but for the purpose of land titles, the older districts continued to be used. For instance, a land transaction in Kaupō was still recorded as taking place in Kaupō, not in Hāna, even though Kaupō was merged with Hāna for administrative and judicial purposes.

#### STATISTICAL ANALYSIS OF RESEARCH FINDINGS<sup>42</sup>

##### TITLE TYPES

Title type	Number of ahupua'a	Percentage
Crown	149	8.2
Government	1,181	64.7
konohiki	238	13.0
private	25	1.4
konohiki or private without proper RPs	132	7.2
divided between konohiki and government	37	2.0
divided; konohiki part without proper RP	8	0.4
various; not awarded on ahupua'a level	7	0.4
total	1,825	100

Of the 1,825 ahupua'a we have counted throughout the archipelago, by far the largest portion are Government land by original title, namely 1,181 ahupua'a (64.7%). A much smaller amount, 149 (8.2%) are Crown lands. Two hundred thirty-eight (13.0%) were awarded and patented as konohiki lands, and 25 (1.4%) were awarded and patented to private persons outside the Māhele as confirmations of oral deeds. An important number, namely 125 ahupua'a, originally deeded to konohiki, should have been forfeited to the Government for lack of a proper LCA and Royal Patent, including those for which Royal Patents were forged in the aftermath of the 1893 overthrow.<sup>43</sup> Seven ahupua'a were similarly awarded to private parties by the Land Commission as oral deed confirmations but should have forfeited to

the government for lack of proper RPs as well. Together this makes for 132 ahupua'a that should have eventually reverted to the government.

In a few ahupua'a, the original title granting process was even more complex. In some cases, individual ahupua'a were divided into halves. Thirty-seven were divided between a konohiki and the government. An additional eight were divided between a konohiki and the government, but the konohiki half should have forfeited to the government for lack of a proper RP, as described above.

In seven ahupua'a, all located in the Kona, 'Ewa, and Ko'olaupoko moku on O'ahu, (Waikiki, Honolulu, Kalihi, Kalauao, Waiau, Mananaiki, Waiahole), no title exists on the ahupua'a level, and separate titles were established for each 'ili. This might also apply to four more ahupua'a (Kapalama, Waimalu, Waimano, Mānana Nui, Waikele), for each of which a konohiki is ambiguously awarded the largest part, and it remains unclear whether that person is konohiki of the entire ahupua'a—with 'ili not under his or her control being 'ili kūpono—or whether there is no single title at the ahupua'a level.

## SHAPE STATISTICS

Shape type	Number of ahupua'a	Percentage
regular (mauka to makai)	1,430	78.4
<i>watershed</i>	98	5.4
<i>non-watershed</i>	1,332	73.0
landlocked	261	14.3
split in several lele	109	6.0
coastal only	25	1.4
across-island	8	0.4
total	1,825	100

The vast majority of ahupua'a are relatively narrow stripes of land running from mauka (inland) to makai (the sea), including several ecological zones, from off-shore fisheries and coastal settlement areas, through intensive agricultural zones, to forested uplands. According to Lyons, "[t]he main idea of the Ahupuaa, or primary division, was to run a strip from the shore to the summit of the mountain, in order to give equitable share of all the different products of the soil and sea."<sup>44</sup> This shape type is generally similar to that of second or third-order



land divisions on other high volcanic islands in Oceania, as referred to above. Since the vast majority of ahupua'a correspond to this shape type, it will be referred to as the "regular" type here.

However, a small but still significant number of ahupua'a diverge from this regular model: A total of 261 ahupua'a, mainly concentrated in Ka'u, Hilo and Kohala on Hawai'i, and in Kula, Hali'imaile and Makawao on Maui, are landlocked, i.e. are cut off from coastal access. This represents a very significant anomaly, since this means inhabitants of these ahupua'a were either not using any marine resources, which seems unlikely, or they needed to trade them from outside communities.

A more rare shape type of ahupua'a, essentially limited to Lāna'i, and parts of Moloka'i, runs across the island, from one shore through the central uplands or mountain range to the other shore, for instance Kaunolū on Lāna'i and Pālā'au on Moloka'i. Kelly likens this type to the divisions of low coral islands in other part of Polynesia,<sup>45</sup> but it also exists on some relatively flat volcanic islands. Altogether, eight ahupua'a have been identified as extending fully or partly across-island. Some of the ahupua'a of Ni'ihau (of which only names but no boundaries have been preserved on maps) might also run across the island that way.

Another complex type of ahupua'a consists not of a single bounded body of land but of several scattered sections (lele). This is not uncommon for 'ili within ahupua'a but rare for ahupua'a. Overall there are 109 ahupua'a split into lele, found mainly in Lāhainā on Maui, in central Moloka'i, and in a few cases on O'ahu.

Twenty-five ahupua'a were limited to coastal areas and did not extend onto any significant elevation. Most of them are located in Lāhainā. Keone'ō'io in Honua'ula, Maui, and possibly Kama'alaea on Maui and Punalau on Moloka'i would be other examples, but the boundaries of these three are not well documented in archival sources.

While Lyons defines the size range of ahupua'a to be between 100 to 100,000 acres,<sup>46</sup> it is actually much more extreme, since many of the small ahupua'a in Lāhainā contain only three or four acres, some of the smallest being Uhao 1 with 1.93 acres, Uhao 2 with one acre and 23 rods, and Kuholilea 1 with 1.107 acres.<sup>47</sup> On the other extreme, on the island of Hawai'i, the vast majority of ahupua'a are of

medium size but reach only into the forested uplands. Then, as Lyons put it, there are “[. . .] larger ahupuaas which are wider in the open country than the others, and on entering the woods expand laterally so as to cut off all the smaller ones, and extend toward the mountain till they emerge into the open interior country, not however to converge to the point at the tops of the respective mountains.”<sup>48</sup> This category includes several dozen ahupua‘a, for example Pāpa‘ikou and Honohina in Hilo, Ka‘ala and Nienie in Hāmākua, Kahauale‘a in Puna, and Wai‘ōhinu in Ka‘ū. The vast interior of Hawai‘i Island, above the forested zone, however, is shared by only five ahupua‘a of an immense size (about 100,000 acres or more), namely Ka‘ohe of Hāmākua, Humu‘ula of Hilo, Kapāpala and Kahuku of Ka‘ū and Keauhou 2 of Kona, which in turn cut off the large-sized ones of the medium category.

Though the medium-sized, mauka to makai extending ahupua‘a are the statistical majority type, this should not be construed as making the various “diverging” cases a less important or less integral part of the complex system of traditional land divisions. Each ahupua‘a and its particular boundaries have equally important historical, cultural, and resource management significance. Furthermore, it was the totality of all of these complex divisions across islands and ecosystems and the interplay between each of them that made the entire system function for people and resources to create abundance.

#### THE WATERSHED MYTH

One of the most persistent myths in popular narratives is the idea that ahupua‘a are usually stream drainages bounded by watersheds.<sup>49</sup> Equating ahupua‘a to watersheds is problematic because it empties the ahupua‘a of its cultural context.<sup>50</sup> Furthermore, empirical evidence clearly shows that most ahupua‘a do not correspond to a watershed. Even if applying the most liberal interpretation of the concept,<sup>51</sup> only 98 ahupua‘a (5.4%) can be regarded as bounded by watersheds. Of these there are none on Hawai‘i Island, 15 on Maui, i.e. 2.4% of Maui’s total of 636 ahupua‘a, and 8 of a total of 85 (9.4%) on Moloka‘i. Only O‘ahu with 46 out of a 100 total ahupua‘a (46.0%) and Kaua‘i with 28 out of 82 (34.1%) have significant percentages of watershed-ahupua‘a. The vast majority of ahupua‘a throughout the

islands, are regularly shaped (mauka to makai) but not watershed-bounded.

There are several reasons for these statistical facts. First, proponents of the "watershed theory" ignore that most parts of Hawai'i Island and some parts of East Maui, together accounting for more than half of all ahupua'a of the archipelago, are young volcanic flatlands with no surface watercourses, so that the idea of constructing a land division along watersheds would make no sense there at all. Ahupua'a in these regions are bounded by straight lines running between markers visible on the ground, such as minor volcanic cones, trees or rocks (as shown on fig. 3), similar to land divisions on topographically similar islands in other parts of Polynesia. The second landscape type, common in large parts of East Maui and on the Hilo-Hāmākua coast of Hawai'i island, has the gentle volcanic slope lands cut by deep v-shaped gulches or stream valleys. In this landscape type, ahupua'a boundaries are usually the streams or gulches, and the main body of the ahupua'a consists of the gently sloped land between. Geologically older landscapes, with large and deep valleys that would be suitable for the formation of watershed-bounded ahupua'a, exist only in parts of Hāmākua and Kohala on Hawai'i island, on West Maui and some parts of East Maui, on parts of Moloka'i, on O'ahu and on Kaua'i. It is there that the few ahupua'a strictly corresponding to watersheds are found, e.g. Wainiha on Kaua'i or Kahana on O'ahu. Even in these areas, however, many ahupua'a boundaries do not follow watersheds but often contain straight lines or follow ridgelines that are not main watersheds, and sometimes clearly cut across watersheds. For example, Kōloa in Kona, Kaua'i extends over the watershed into the upper Hulē'ia river valley that drains into the Puna moku, or He'eia in Ko'olaupoko, O'ahu extends over the watershed into the upper drainage of the Kahalu'u stream, as does nearby Kailua into the upper Kāne'ohē watershed (see fig. 4). The perhaps most well-known case is the ahupua'a<sup>52</sup> of Wai'anae on O'ahu, which extends over the Wai'anae range, through the central O'ahu saddle (which drains into Waialua and 'Ewa) all the way to the peaks of the Ko'olau range.

Given our debunking of the "watershed theory," a more likely rationale for ahupua'a boundaries is probably a *culturally appropriate, ecologically aligned, and place specific* unit with access to diverse resources. This could have been done to provide some level of resource and eco-

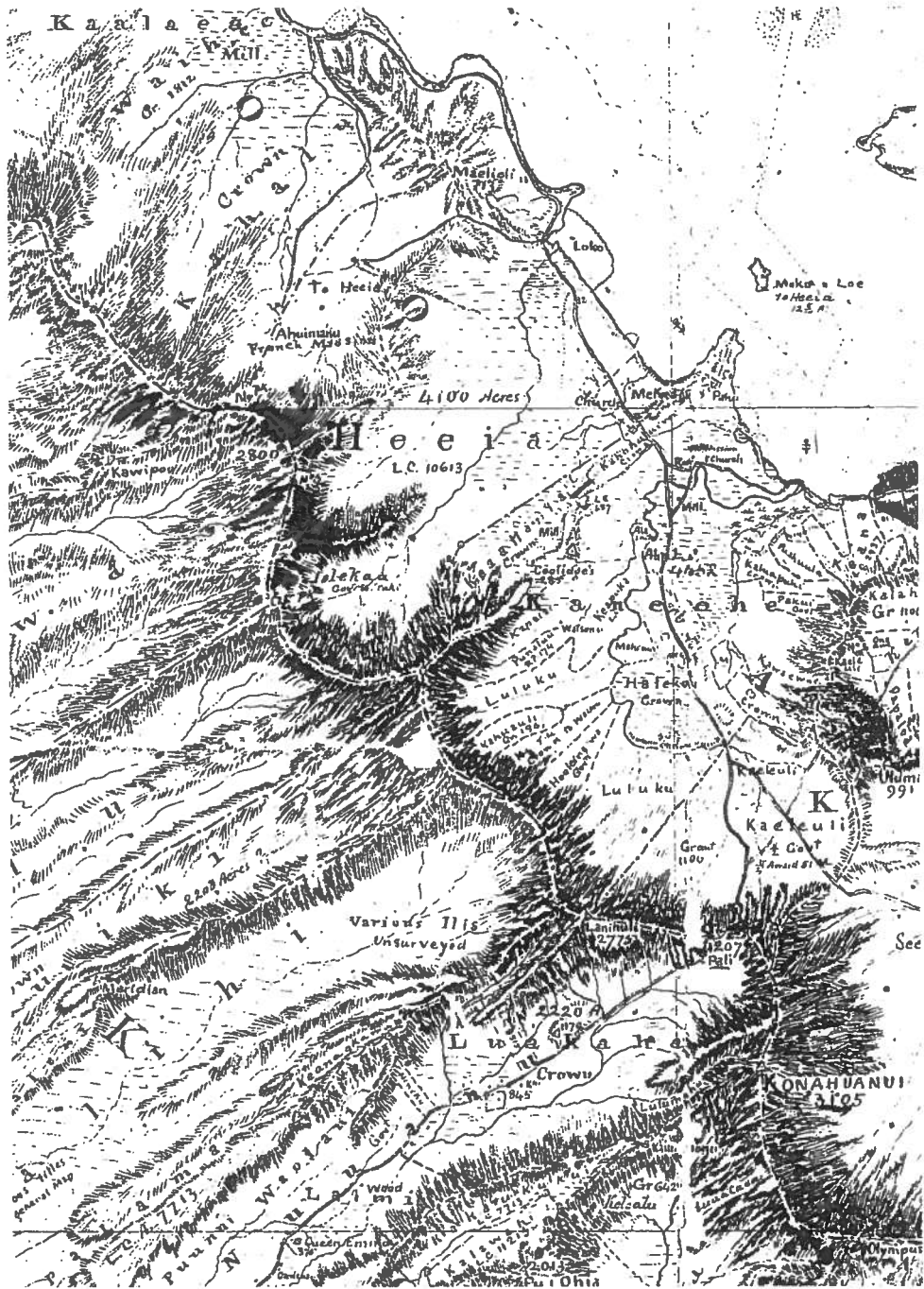
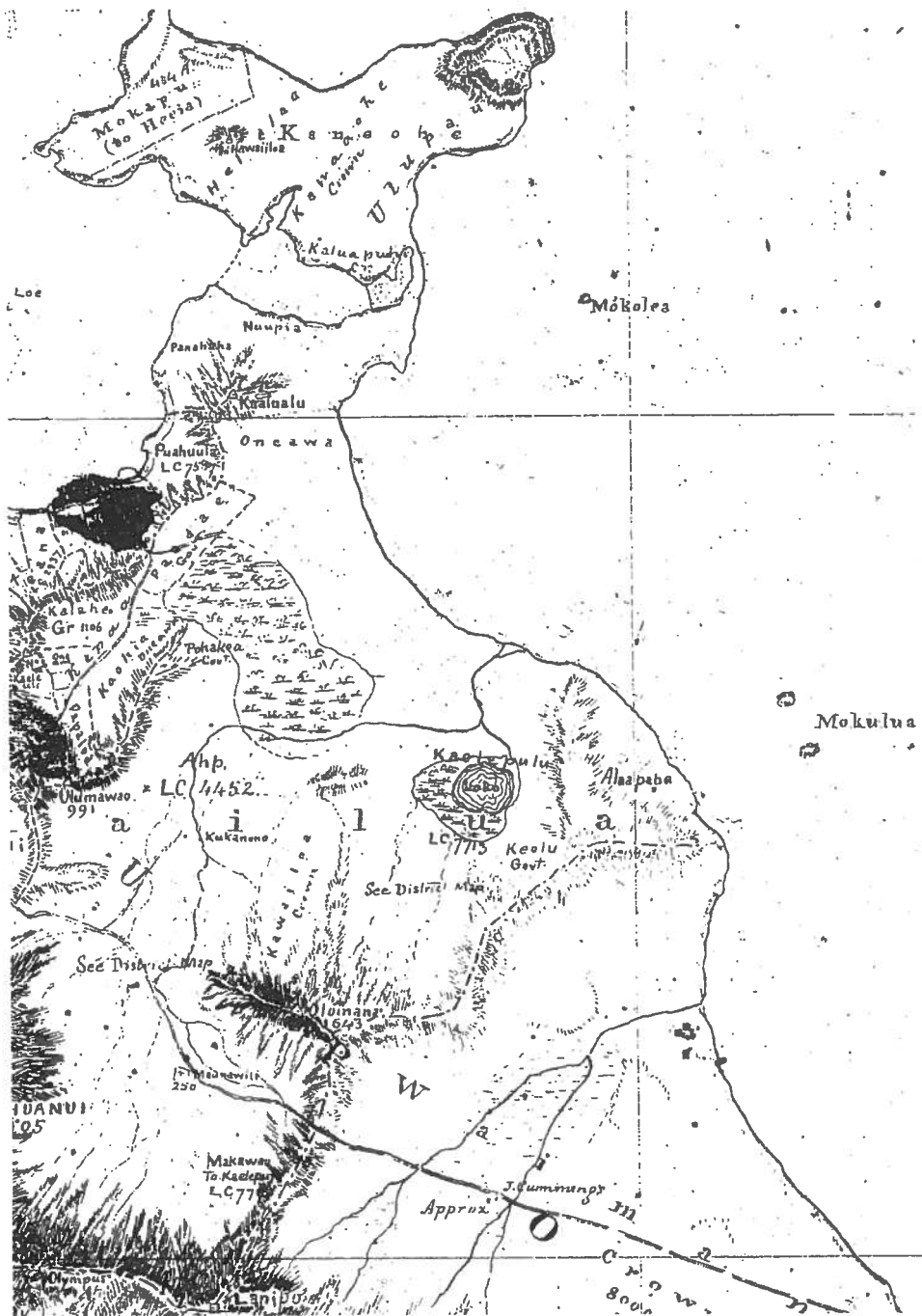


FIGURE 4. Portion of 1876 HGS map of O'ahu (Reg. 1380), showing a part of the moku of Ko'olaupoko. Dashed and dotted lines represent ahupua'a boundaries; thin-



ner dashed lines represent 'ili boundaries. Note the eastern boundaries of the ahupua'a of He'eia and Kailua, both stretching into the respective neighboring watersheds.

conomic self-sufficiency for the inhabitants of the particular ahupua'a. The majority of ahupua'a seem to be constructed to ensure resource diversity. Divergence from watershed boundaries in areas where watershed boundaries could have been possible might be explained by the intent to provide more diversified resources. We caution however against generalizing the theory of economic self-sufficiency as well. Some, if a relatively small percentage, of the ahupua'a could clearly not sustain themselves economically but would need to trade with neighboring ahupua'a, for example, for fish and other marine materials in the landlocked ahupua'a, and for agricultural products and possibly even fresh water in some of the smaller-sized ahupua'a in leeward areas.

#### PARTICULARITIES OBSERVED ON HAWAI'I ISLAND

Having given a statistical outline of ahupua'a throughout the archipelago, we will now examine the particularities in ahupua'a organization on one of the islands in more detail. Similar detailed analyses of the other islands will be done in a future publication. We chose Hawai'i Island in this article, first, because enumerations of lands in sources such as the Māhele book usually begin with this island, and secondly, because overall, the Big Island appears to have the most regular pattern of land organization and it is the home island of one of our authors.

The unusual organization of the island's interior, with a few ahupua'a not unusually large at the coast but expanding enormously inland to take up the vast interior, has already been described above. Having the boundaries of five ahupua'a encompass the majority of the uplands of the island would allow for increased efficiency in managing precious forest and cultural resources in the mauka regions and island summits. The other unusual feature on the island is the unusually large size of its moku/kalana compared to other islands (see fig. 5). Each of them contains about 100 or even more ahupua'a, as opposed to the two-digit numbers of ahupua'a for moku on all the other islands. It appears, however, that larger moku on Hawai'i Island were at one point divided into 'okana. For instance, archival documents in the Bernice Pauahi Bishop Museum list the names of 12 'okana within Kona<sup>53</sup> (with 194 ahupua'a the largest moku in all the

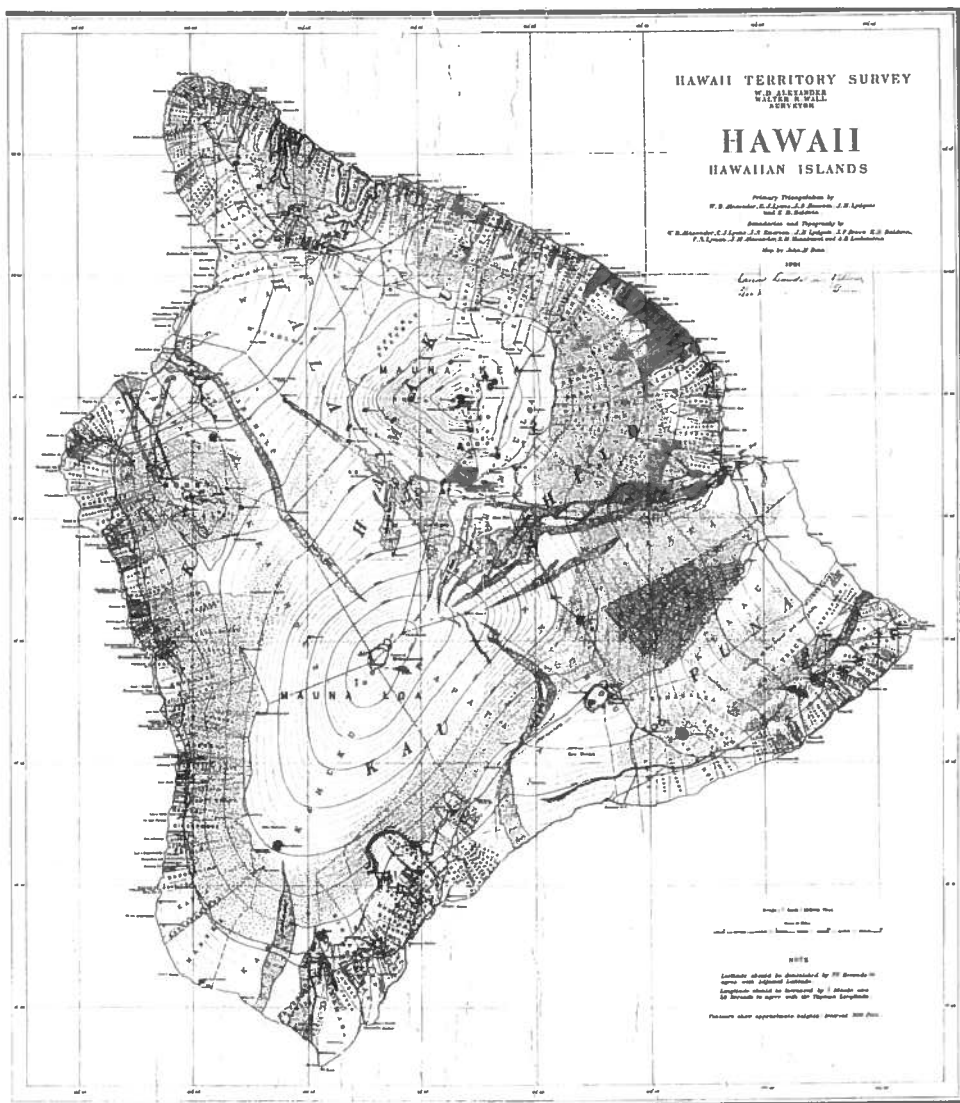


FIGURE 5. 1901 HTS map of Hawai'i Island (Reg 2124), a compilation of HGS surveys from the late nineteenth century.

islands). The obscure name of “Kapalilua” in South Kona, used in the Māhele Book to group some ahupua‘a in the area (possibly identical to “Palelua” written between Miloli‘i and Honokua on the 1835 Lāhaināluna map), might be one of these ‘okana, even though it is not included in the Bishop Museum list.

The kalana of Ka‘ū is unusual in that it has a remarkably high number of landlocked ahupua‘a. Furthermore, many of Ka‘ū’s ahupua‘a have boundaries that are not clearly marked on maps, and some are not even marked by name. If it was not for a list of ahupua‘a of Ka‘ū ordered by locational sequence,<sup>54</sup> some of them could not have been located at all. The 1868 lava flow, marked on many maps, probably obscured several ahupua‘a and their boundaries, which might explain why several of Ka‘ū’s ahupua‘a are mentioned in the Māhele Book but not shown on any map.

An unusual land division is the landlocked section of ‘Ōla‘a (sometimes spelled “O Laa” or “Laa”) between Puna and South Hilo. It is listed as part of Hilo in Mataio Kekuaanoa’s 1847 list of the Mō‘ī’s land.<sup>55</sup> In the first half of the Māhele Book, ‘Ōla‘a is a kalana of its own, then in the second part it is listed as an ahupua‘a within Hilo, corrected to Puna in pencil, which was apparently followed by most surveyors, since all HGS maps are consistent in showing ‘Ōla‘a as part of Puna, and in 1874 the Boundary Commission identified it as an ahupua‘a within Puna as well.<sup>56</sup> According to surveyor Lyons however, ‘Ōla‘a was originally independent, i.e. neither part of Hilo nor Puna.<sup>57</sup> If we take into account pre-Māhele sources, ‘Ōla‘a was most likely not merely an independent ahupua‘a, but an independent ‘okana, consisting in turn of several ahupua‘a. On the 1838 map of the Hawaiian Islands by S.P. Kalama (fig. 1), ‘Ōla‘a is written as a district name (though smaller than the six major moku, and not color-coded separately from Puna) and includes four names, Kapueuhi, Kii, Kaulele and Kuolo, written in the same style as ahupua‘a names within the area, which are thus presumably the names of the constituent ahupua‘a or ‘ili of ‘Ōla‘a ‘okana.

The district of Hilo, like Ka‘ū, contains a large number of ahupua‘a that are found in various land lists but are not traceable on any map. Three clusters of such ahupua‘a were sold or leased early from the government to private parties and became consolidated under the name of one of the ahupua‘a in the block, which subsequently became



the only name for the entire area on the maps. Thus the contiguous ahupua'a of Makea, Hali'ilau, Kaupakuea, Kaoma, Kiapu, Haukalua 1 and 2, Nene and Kapehu A in South Hilo, sold in 1851 to Emma Metcalf as Grant 872,<sup>58</sup> later to become Kaupakuea Plantation, are collectively labelled as Kaupakuea on HGS maps.<sup>59</sup> Similarly, the names of the 14 or 15 small ahupua'a between Waipunalei and Humu'ula, acquired by T. Spencer from the Government, have been omitted on most maps,<sup>60</sup> while the seven ahupua'a between Humu'ula and the moku boundary with Hāmākua, leased from the Government to what became 'O'ōkala Sugar Plantation, ended up being collectively labelled as 'O'ōkala on the maps.<sup>61</sup> Furthermore, being a very large kalana with over 150 ahupua'a, Hilo was likely divided into constituent 'okana in a way similar to Kona. One hint for this might be the fact that on the 1838 map by S.P. Kalama, as well as an earlier one printed at Lāhaināluna in 1835, "Honoli'i" is written as if an ahupua'a name in an area of South Hilo. Because on later maps, Honoli'i is a place name designating a cove surrounded by multiple ahupua'a ('Alae, Kaiwiki 1, Kaiwiki 2, Maumau, Kikala and Pauka'a), Honoli'i it is most likely a supra-ahupua'a land unit, possibly an 'okana.

The area with the most complex land divisions of Hawai'i Island is South Kohala, and in particular its large land unit named Waimea, the status of which is somewhat ambiguous. There are a large number of land sections within the Waimea area, many of which in size and shape resemble landlocked ahupua'a like those of Ka'ū. The Māhele Book is inconsistent in classifying these, considering Waimea to be an ahupua'a and some of the divisions, such as Wa'awa'a, Waiaka 1 and 2, Waikoloa, Pu'ukapu, Kalāhuipua'a and 'Anaeho'omalua to be 'ili within that ahupua'a, while others, such as Pauahi 1 and 2, Lanikepue, and Puakō are listed in the Māhele Book as ahupua'a by themselves. Survey plats and HGS maps are similarly inconsistent, and so are the locations indicated for kuleana awards in the area. The Boundary Commission appears to have been similarly perplexed, referring to the land section as the "Ahupuaa (or Kalana) of Waimea."<sup>62</sup> In 1875, expert surveyor Lyons determined that Waimea was an ahupua'a of which, "nine tenths of this ahupuaa [were] taken up with the independent ili of Puukapu and Waikoloa."<sup>63</sup> Nearly 20 years later he did not want to make a definitive classification, referring to the divisions within Waimea as "ilis or subordinate ahu-

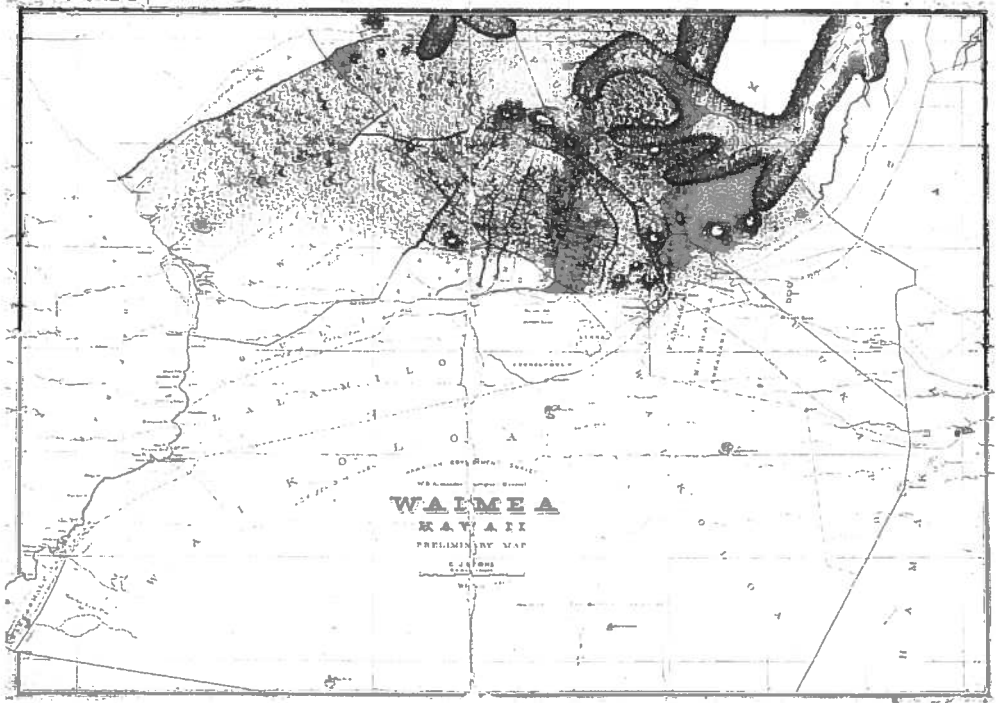


FIGURE 6. 1885 HGS map of Waimea, South Kohala (Reg. 1080).

puaas.”<sup>64</sup> Furthermore, the boundaries of some of these divisions are unclear. Wa‘awa‘a, for instance, is identified as an ahupua‘a in the 1848 Crown and Government Lands act, while it is shown as a small ‘ili with unclear boundaries situated within the larger land section of Lālāmilo on a 1915 HTS map.<sup>65</sup> Maps of the HGS such as Reg 1080 (fig. 6)<sup>66</sup> show the divisions of Paulama, Noho‘āina and Pukalani as larger land units but without clear boundaries, while on the HTS map referred to above the three sections are very tiny and surrounded by parts of Pu‘ukapu, thus likely to be considered divisions of a lower level. It could be possible that Waimea was originally neither a kalana nor an ahupua‘a but a ‘okana, later relegated to the status of ahupua‘a, and the constituent ahupua‘a of that ‘okana thereby equalized to the smaller original ‘ili within them, which might explain some of these inconsistencies.

## CONCLUSION

Our research has shown that the Hawaiian land division system was diverse and complex. This effort has added a significant amount of analysis to better understand some of that system’s nuances as well as statistics on ahupua‘a shapes, diversity, and overall count. We have found that equating ahupua‘a to watershed or a pie-shaped wedge of land is problematic. Understanding Hawaiian concepts through English synonyms hinders one’s ability to grasp the breadth of ahupua‘a, the larger Hawaiian land system, and its key components for islands sustainability. With that knowledge we have translated ahupua‘a as a *culturally appropriate, ecologically aligned, and place specific* unit with access to diverse resources. The land reform undertaken by the Hawaiian Kingdom took this system to a new level by modifying it to fit into a functioning bureaucratic nation-state.

The original moku/kalana and ahupua‘a organization for each island was done by independent rulers, not by a central archipelago-wide authority. Kamehameha built on the existing systems on each island as he unified the islands. The variations between the large moku on Hawai‘i Island and the comparatively small units on Maui, for instance, is likely a result of the independent development of these systems. Both Maui mō‘ī and Hawai‘i mō‘ī created each an administrative system appropriate for the needs of their respective social systems and governments, and in accordance with variations between ecosystems, resources, and spiritual significance of place.

The 1848 Māhele event is a pivotal source for understanding the land system at the eve of these reforms. It recorded in minute detail lands administered by konohiki, and how they were then divided between the king and konohiki by the will of the mō‘ī and in accordance to rank and relationship. Kame‘eleihiwa has provided a comprehensive analysis of these relationships.<sup>67</sup> Furthermore, recent scholarship has argued that the Māhele could be seen as a modernized kālai‘āina,<sup>68</sup> accomplished by using the borrowed technologies of writing and mapping.

While it is clear that the Māhele was accomplished by building on existing indigenous structures like kālai‘āina and place divisions, it also modified the structure that it built upon. There is evidence that changes in land administration happened throughout the nineteenth

century, both before and after the Māhele. It is mostly likely that the overall number of land sections identified as ahupua'a was significantly reduced during that time period. The changes after the Māhele are most obvious: If a group of numbered ahupua'a with the same name ended up having the same konohiki, or all becoming Government or Crown land, they were frequently consolidated into one.<sup>69</sup> In a similar fashion, though less frequently, ahupua'a divided in half during the Māhele were sometimes considered numbered ahupua'a of the same name on later maps.<sup>70</sup> Also, two or more neighboring ahupua'a under the same konohiki, or all being Government or Crown land, would frequently be consolidated under the name of the larger or otherwise more significant of the ahupua'a.<sup>71</sup>

The early maps by missionaries and Hawaiian surveyors at Lāhainā-luna, however, provide evidence that changes also took place before the Māhele. Apparently, many ahupua'a became consolidated during the 1830s and 1840s and/or were relegated to 'ili status, while some kalana and/or 'okana became consolidated, or relegated to ahupua'a status in turn. This explains the disappearance of many ahupua'a that are on the pre-Māhele maps and early land lists but are not listed in the Māhele Book.

We have arrived at the number of 1,825 ahupua'a. This number was developed over the course of ten years of intense study and is also merely a starting point for conversations about an ahupua'a inventory for the Hawaiian Kingdom. Since we have gathered substantial evidence that the number of ahupua'a fluctuated considerably during the nineteenth century, both before and after the Māhele, any number of ahupua'a need to be dated to be accurate. The work we have presented attempts to include any land section name for which there is evidence that it was considered as an ahupua'a at one point of time during the Hawaiian Kingdom.

The present study makes no claim to be definitive, and presents merely the findings of a survey of accessible public records, both archival and cartographic. We hope this work will add to the larger conversations on sustainability and land tenure for the Hawaiian Islands. We are fairly confident, however, that there exists kama'āina knowledge about land boundaries and land division that were preserved orally and never recorded by the Hawaiian Kingdom's bureaucracy. While it is likely that some of that information has become lost, it is equally

plausible that some of it has been preserved to this day. Therefore, one way of revealing further information on land division names and boundaries is to research and incorporate unrecorded family knowledge in culturally appropriate ways from those who may be willing to share. This methodology is important, given the precedence of kama'āina testimony in the settling of land boundaries in the Hawaiian Kingdom.<sup>72</sup> Secondly, this present project attempts to survey the Hawaiian land division system only from the island and district down to the ahupua'a level. Land sections of the next lower category, 'ili, have not generally been the subject of this study. However, some of them had in fact to be examined in detail in order to understand ahupua'a boundaries, especially on O'ahu.

Furthermore, while this study merely attempts to create an inventory of ahupua'a names, in-depth research of local mo'olelo and detailed title history for every ahupua'a has yet to be done. Single-ahupua'a studies, like the ones by Andrade on Hā'ena on Kaua'i; by Stover on Lā'ie, O'ahu; by Stauffer on Kahana, O'ahu; by Oliveira on Kahakuloa, Maui; and by Lum-Ho on Hālawa on Moloka'i, or studies of small groups of contiguous ahupua'a like Kelly on a section of Ka'ū, or Linnekin on a section of Ko'olāu, Maui,<sup>73</sup> are of tremendous value and provide intricate details about these individual ahupua'a and moku. Given the great number of ahupua'a we have identified in this article, there are hundreds of those studies waiting to be done.

## NOTES

Acknowledgements: Since this research is an outgrowth of an on-going project of digitizing nineteenth Hawaiian land title documents at the University of Hawai'i Center for Hawaiian Studies, we wish to thank Professor Lilikalā Kame'eleihiwa, who worked with Kamana Beamer in envisioning the project and has been supervising it. Her efforts and 'ike [knowledge] are tremendous and have benefited more students than there are ahupua'a. We also would like to acknowledge the contribution of Darienne Dey, who worked with Lorenz Gonschor on the digitization of the Māhele Book and the 1929 LCA Indices book, both of which laid the groundwork for our database of ahupua'a names. Furthermore, we wish to acknowledge Donovan Preza, who also worked on the digitization project, and whose insights he shared with us in numerous conversations contributed to improving our work. Mahalo nui iā 'oukou pākahi a pau.

<sup>1</sup> See for instance, E.S. Craighill Handy and Elizabeth G. Handy with Mary Kawena

- Pukui, *Native Planters of Old Hawaii: Their Life, Lore and Environment*, Bernice Pauahi Bishop Museum Bulletin No. 233 (Honolulu: Bishop Museum Press, 1972); Lilikalā Kame'eleihewa, *Native Land and Foreign Desires: Pehea Lā E Pono Ai?* (Honolulu: Bishop Museum Press, 1992); Patrick Vinton Kirch, *The Evolution of the Polynesian Chiefdoms* (Cambridge: Cambridge University Press, 1984), *How Chiefs Became Kings: Divine Kingship and the Rise of Archaic States in Ancient Hawai'i* (Berkeley: University of California Press, 2010), *A Shark Going Inland is My Chief: The Island Civilization of Ancient Hawai'i* (Berkeley: University of California Press, 2012); B. Kamanamaikalani Beamer, *Huli ka palena* (Honolulu: University of Hawai'i master's thesis, 2005), *Na Wai ka Mana? 'Ōiwi Agency and European Imperialism in the Hawaiian Kingdom* (Honolulu: University of Hawai'i doctoral dissertation, 2008); Peter M. Vitousek, *Nutrient Cycling and Limitation: Hawai'i as a Model System* (Princeton: Princeton University Press, 2004).
- <sup>2</sup> Marion Kelly, *Changes in Land Tenure in Hawaii, 1778–1850* (Honolulu: University of Hawai'i master's thesis, 1956) 11; R. Gerard Ward, "Land Tenure," in *The Cambridge History of the Pacific Islanders*, ed. Donald Denoon (Cambridge: Cambridge University Press, 1997) 91.
- <sup>3</sup> William D. Alexander, "Ancient Systems of Land Tenure in Polynesia," *F* 46, 4 (April 1888): 26–27; 5 (May 1888): 36–37; 6 (June 1888): 47–49; Kirch, *How Chiefs Became Kings*; Robert J. Hommon, *The Ancient Hawaiian State: Origins of a Political Society* (Oxford: Oxford University Press, 2013).
- <sup>4</sup> Curtis J. Lyons, "Land Matters in Hawaii," *The Islander* 1, 18 (July 2, 1875): 104.
- <sup>5</sup> Samuel M. Kamakau, "Ka Moololo o Hawaii Nei, Helu 12. No Ke Kaapuni Makaikai i na Wahi Kaulana a me na Kupua, a me na 'Lii Kahiko mai Hawaii a Niihau." *Nupepa Kuokoa* 4, 35 (Sept 2, 1865): 1.
- <sup>6</sup> Robert J. Hommon, *The Formation of Primitive States in Pre-Contact Hawai'i* (University of Arizona doctoral dissertation, 1976) 174, 230–231.
- <sup>7</sup> Davida Malo, *Ka Moololo Hawaii*, ed. Malcolm N. Chun (Honolulu: The Folk Press, Kapiolani Community College, 1987) 14.
- <sup>8</sup> Curtis J. Lyons, "Land Matters in Hawaii," *The Islander* 1, 20 (July 16, 1875): 119; Beamer, *Na wai ka mana* 83–86. Given the relatively small number of primary sources that include 'okana and kalana it is difficult to reconcile the complexity of these divisions.
- <sup>9</sup> Gary L. Fitzpatrick and Riley M. Moffat, *Palapala'āina*, vol. 1, *The Early Mapping of Hawai'i* (Honolulu: Editions Limited, 1986) 112.
- <sup>10</sup> Fitzpatrick and Moffat, *Palapala'āina*, vol. 1: 16–17; 41.
- <sup>11</sup> William Ellis, map *Hawaii. The Outline from Vancouver; Improved by the Deputation*, included in William Ellis, *A Journal of a Tour around Hawaii, the Largest of the Sandwich Islands; by a Deputation from the Mission on those Islands* (Boston and New York: Crocker & Brewster and John P. Haven, 1825), facing p.2; *Map of Hawaii, the Largest of the Sandwich Islands; Improved from Vancouver's Survey*. Included in William Ellis, *Narrative of a Tour through Hawaii, or Whyhyee* (3rd ed., London: H. Fisher & Son and P. Jackson, 1827), frontispiece; Ursula Emerson, manuscript maps of Ni'ihau, Kaua'i and O'ahu, 1833, HHS collection, manuscript copies

- with some modifications of the Kaua‘i and O‘ahu sheets in Hawai‘i State Survey Division as Reg. 432 and 445.
- <sup>12</sup> *Hawaii*. Fragment of a larger map of the Hawaiian archipelago printed in Lahainaluna in 1835. Depicted and referenced in David W. Forbes, *Engraved at Lahainaluna. A History of Printmaking by Hawaiians at the Lahainaluna Seminary, 1834 to 1844, with a Descriptive Catalogue of all Known Views, Maps and Portraits* (Honolulu: HMCS, 2012) 148–49.
- <sup>13</sup> Kalama, S.P. *A map of the Hawaiian Islands according to the latest Surveys* (Lahainaluna, 1838), partly reproduced in Gary L. Fitzpatrick and Riley M. Moffat, *Palapala‘āina*, vol. 2, *Surveying the Mahele: Mapping the Hawaiian Land Revolution* (Honolulu: Editions Limited, 1995) 24, fully reproduced in Forbes, *Engraved at Lahainaluna*, back pocket.
- <sup>14</sup> Kelly, *Changes in Land Tenure in Hawaii*; Jon J. Chinen, *The Great Mahele: Hawaii’s Land Division of 1848* (Honolulu: University of Hawai‘i Press, 1958); Maivan C. Lam, “The Kuleana Act Revisited: The Survival of Traditional Hawaiian Commoner Rights in Land,” *Washington Law Review* 64, 2 (1989): 233–288; Kame‘eleihiwa, *Native Land and Foreign Desires*; ‘Umi Perkins, “Teaching Land and Sovereignty—A Revised View,” *Hawaiian Journal of Law and Politics*, 2 (Summer 2006): 97–111; Beamer, *Na Wai ka Mana*; Donovan Preza, *The Empirical Writes Back: Re-examining Hawaiian Dispossession Resulting from the Māhele of 1848* (Honolulu: University of Hawai‘i master’s thesis, 2010), only to name a few.
- <sup>15</sup> Government of the Hawaiian Kingdom, *Buke Kaka‘i Paa no ka Mahele aina i Hooholoia iwaena o Kamehameha III a me Na Lii a me ‘Na Konohiki ana, Hale Ali‘i Honolulu, Ianuari 1848*. Manuscript book, original in AH. For discussion of the transactions recorded in the book, see also Kelly, *Changes in Land Tenure in Hawaii*; Kame‘eleihiwa, *Native Land and Foreign Desires*; Beamer, *Na Wai ka Mana* and Preza, *The Empirical Writes Back*.
- <sup>16</sup> In terms of ‘ili, the Māhele Book lists only ‘ili kūpono, i.e. ‘ili that have a different konohiki affiliation than the rest of the ahupua‘a, while ‘ili that are subdivisions within an ahupua‘a are not of much concern in this process. While it appears that some ahupua‘a are indeed too small to possibly be subdivided into any ‘ili, we would assume that most ahupua‘a do consist of several ‘ili, and that their overall number is thus likely to be at least as high as that of ahupua‘a, and more likely to be actually higher. A detailed listing and boundary definition of ‘ili would be especially important for the moku of ‘Ewa, Kona and Ko‘olaupoko on O‘ahu, where konohiki titles were generally awarded on the ‘ili, not the ahupua‘a, level.
- <sup>17</sup> Curtis J. Lyons, *A History of the Hawaiian Government Survey with Notes of Land Matters of Hawai‘i*, Appendixes 3 and 4 of Surveyor’s Report for 1902 (Honolulu: The Hawaiian Gazette Co., 1903) 5.
- <sup>18</sup> Fitzpatrick and Moffat, *Palapala‘āina*, vol. 2: 28.
- <sup>19</sup> Undated list of “Ahupuaa of East Maui,” DLNR, 2-3, Land Commission Records 1846–1856, AH.
- <sup>20</sup> Government of the Hawaiian Kingdom, “An Act Relating to the Lands of His

- Majesty the King and of the Government, 7 June 1848" (Reprinted in Territory of Hawaii, *Revised Laws of Hawaii*, Volume II, 1925: 2152–2176).
- <sup>21</sup> The latter, abbreviated as "Reg.," are currently located at the Survey Division, Department of Accounting and General Services where they can be accessed online, <<http://ags.hawaii.gov/survey/map-search/>>
- <sup>22</sup> Curtis J. Lyons, "Land Matters in Hawaii," *The Islander* 1, 33 (Oct 15, 1875): 222–223; B. Kamanamaikalani Beamer and T. Ka'eo Duarte, "I palapala no ia aina—Documenting the Hawaiian Kingdom: A Colonial Venture?," *Journal of Historical Geography* 35 (2009): 77–84.
- <sup>23</sup> Preza, *The Empirical Writes Back*.
- <sup>24</sup> For a summary of the work of the Hawaiian Government Survey and reproductions of some of the maps produced, see Gary L. Fitzpatrick and Riley M. Moffat, *Palapala'aina*, vol. 3: *Mapping the Lands and Waters of Hawai'i: The Hawaiian Government Survey* (Honolulu: Editions Limited, 2004), as well as Beamer, *Huli ka palena; Na wai ka mana*; and Beamer and Duarte, "I palapala no ia aina."
- <sup>25</sup> Lyons, "Land Matters in Hawaii;" A *History of the Hawaiian Government Survey*; William D. Alexander, *A Brief History of Land Titles in the Hawaiian Kingdom*, Appendix 1 to Surveyor General's Report, Interior Department (Honolulu: PCA Steam Print, 1882); "Ancient Systems of Land Tenure in Polynesia;" *A Brief Account of the Hawaiian Government Survey, its Objects, Methods and Results*, Published by Order of the Minister of the Interior of the Hawaiian Kingdom (Honolulu: Bulletin Steam Press, 1889).
- <sup>26</sup> <<http://ags.hawaii.gov/survey/map-search/>>
- <sup>27</sup> Alexander, *A Brief Account of the Hawaiian Government Survey* 13–14.
- <sup>28</sup> Fitzpatrick and Moffat, *Palapala'aina*, vol. 3: 30.
- <sup>29</sup> Government of the Hawaiian Kingdom, *Papa Kuhikuhi o na Kuleana a pau i Hoo-koia e ka poe Luna Hoona Kuleana Aina. Index of all the Claims Awarded by the Land Commission* (Honolulu: P.C. Advertiser Steam Print, 1881).
- <sup>30</sup> Government of the Hawaiian Kingdom, *Index of All Grants Issued by the Hawaiian Government Previous to March 31, 1886. Papa Kuhikuhi o na Apana Aina a pau i Kuaia e ke Aupuni Hawaii Mamua aku i ka La 31 o Marahi, 1886* (Honolulu: P. C. Advertiser Steam Print, 1886). This also includes a lists of Crown land sales before they were declared inalienable in 1865 as well as grants to the Board of Education for the establishment of schools.
- <sup>31</sup> List of Unassigned lands. 1–9 Jan 1888, IDLF, AH.
- <sup>32</sup> Beamer, *Huli ka palena; Na Wai ka Mana*; Beamer and Duarte, "I palapala no ia aina."
- <sup>33</sup> Richard Feinberg, Ute J. Dymon, Pu Paiaki, Pu Rangituteki, Pu Nukuriaki and Matthew Rollins, "'Drawing the Coral Heads': Mental Mapping and its Physical representation in a Polynesian Community," *The Cartographic Journal* 40, 3 (December 2003): 243–253.
- <sup>34</sup> For a detailed discussion of these events and its political ramifications, see D. Keanu Sai, *Ua Mau ke Ea, Sovereignty Endures: An Overview of the Political and Legal History of the Hawaiian Islands* (Honolulu: Pū'ā Foundation, 2011).



- <sup>35</sup> United States Geological Survey, *1: 24,000, 7.5 Minute Series (Topographic)*, various dates starting in 1989. The 132 sheets for the main Hawaiian Islands are accessible through University of Hawai'i Library Digital Collections, <<http://magis.manoa.hawaii.edu/maps/digital/quads.html>>
- <sup>36</sup> Both authors have detected multiple instances of erroneous information relating to ahupua'a names and boundaries on USGS quads, see Beamer, *Huli ka palena* 33-34.
- <sup>37</sup> William D. Alexander, *Hawaiian Geographic Names*, Appendix No. 7 of Report for 1902 of the United States Coast and Geodetic Survey (Washington, D.C.: Government Printing Office, 1903).
- <sup>38</sup> Territory of Hawaii, *Indices of Awards Made by the Board of Commissioners to Quiet Land Titles in the Hawaiian Islands. Compiled and Published by the Office of the Commissioner of Public Lands of the Territory of Hawaii* (Honolulu: Territorial Office Building, 1929). This volume was digitized in 2010 by the authors and Darienne Dey together with the 1848 Māhele Book and the 1888 List of unassigned Lands, and, together with a digitization of all LCA texts, will be made available on the AVA Konohiki website, <<http://www.avakonohiki.org>>.
- <sup>39</sup> Mary Kawena Pukui, Samuel H. Albert and Esther T. Mookini, *Place Names of Hawai'i*, revised and expanded edition (Honolulu: University of Hawai'i Press, 1974).
- <sup>40</sup> Lyons, "Land Matters in Hawaii," 119.
- <sup>41</sup> Robert D. King, "Districts in the Hawaiian Islands," In John Wesley Coulter, *A Gazetteer of the Territory of Hawaii*, University of Hawai'i Research Publication No. 11 (Honolulu: University of Hawai'i, 1935): 216-18.
- <sup>42</sup> Percentages given might not match up to form 100% when added, since in some cases title status or shape type are unclear, and in some cases one ahupua'a has two or more shape types concurrently (e.g. landlocked and consisting of several lele).
- <sup>43</sup> On Royal Patent Upon Confirmation of Award by the Land Commission No. 7993, dated 21 April 1893 (Royal Patents, Book 34, p. 157, ID, AH) the name of Queen Lili'uokalani is crossed out and replaced with the name of Sanford Dole, president of the self-proclaimed "Provisional Government." All Royal Patents subsequently issued are similarly forged, including many on Konohiki awards.
- <sup>44</sup> Curtis J. Lyons, "Land Matters in Hawaii," *The Islander* 1, 19 (July 9, 1875): 111.
- <sup>45</sup> Kelly, *Changes in Land Tenure in Hawaii* 22.
- <sup>46</sup> Lyons, "Land Matters in Hawaii" 111.
- <sup>47</sup> Acreages from Territory of Hawaii, *Indices of Awards Made by the Board of Commissioners to Quiet Land Titles*.
- <sup>48</sup> Lyons, "Land Matters in Hawaii" 111.
- <sup>49</sup> See for instance the claim that "each ahupua'a was a wedge-shaped area of land running from the uplands to the sea, following the natural boundaries of the watershed" on a popular website <<http://www.hawaiihistory.org/index.cfm?fuseaction=ig.page&CategoryID=299>>. See also the recent efforts by an organization to incorrectly "reconstruct" ahupua'a boundaries in that way, not-

withstanding historical evidence to the contrary, as shown on the organization's website <<http://www.islandbreath.org/>>.

<sup>50</sup> Beamer, *Huli ka palena*.

<sup>51</sup> By employing the most liberal interpretation of watershed-ahupua'a here, we mean disregarding minor deviations such as lines across minor tributary gulches and counting as watershed-ahupua'a all those whose original survey plats indicate no deviation from watersheds even if those survey plats do not appear to fully correspond to watersheds when projected onto modern USGS topographic maps.

<sup>52</sup> The status of Wai'anae as an ahupua'a is somewhat unclear and might also be seen as a 'okana instead.

<sup>53</sup> Beamer, *Huli ka palena* 31.

<sup>54</sup> List of Lands in Ka'u, attached to letter to Rev. D.B. Lyons, Sept 25, 1851, IDLF, AH.

<sup>55</sup> List of lands held by the king, composed by Mataio Kekuaaoa, Dec 18, 1847, IDLF, AH.

<sup>56</sup> Boundary Commission report, Hawaii, vol. 1B, p. 300-301, ID, AH.

<sup>57</sup> Lyons, "Land Matters in Hawaii" 119.

<sup>58</sup> Royal Patent Grant 872, issued Sept 2, 1852, Book 4, p. 161, ID, AH.

<sup>59</sup> For instance, on the map *Hawaii, Hawaiian Islands* by John M. Donn et al. (HTS, 1901, on file in Hawai'i State Survey Division as Reg 2124 and reproduced here as fig. 5), which is a compilation of earlier HTS surveys.

<sup>60</sup> The only known map showing these is a sketch map of parts of North Hilo based on information by Hoakimoa and Kamahu, attached to letter by Th. Spencer to Minister of the Interior, May 14 and Oct 15, 1877, IDLF, AH.

<sup>61</sup> E.g. *Map of the Island of Hawaii, Hawaiian Islands* by W.A. Wall et al. (HGS, 1886, on file in Hawai'i State Survey Division as Reg 1265) and the 1901 HTS map of Hawai'i Island referred above (Fig.5 in this article), both of which are compilations of HGS surveys.

<sup>62</sup> Boundary Commission certificate No. 4, Hawaii, vol. 1, p. 16-18, ID, AH.

<sup>63</sup> Lyons, "Land Matters in Hawaii," 119.

<sup>64</sup> Letter by Curtis J. Lyons, acting Surveyor-General, to Curtis P. Iaukea, Commissioner of Crown Lands, Dec 6, 1893, IDLF, AH.

<sup>65</sup> Map titled *Classification Survey of portions of the lands of Waikoloa Nui, Waikoloa Iki, Lalamilo and Puukapu, Waimea, South Kohala, Hawaii* by S.M. Kakanui and T.J.K. Evans (HTS 1915, on file in Hawai'i State Survey Division as Reg 2576).

<sup>66</sup> *Waimea, Hawai'i*, map by C.J. Lyons and W.A. Wall (HGS, 1885, on file in Hawai'i State Survey Division as Reg 1080).

<sup>67</sup> Kame'eleihiwa, *Native Land and Foreign Desires*.

<sup>68</sup> Beamer, *Na wai ka mana* 197.

<sup>69</sup> E.g. the five ahupua'a of Kapaaula 1-5 in Hāmākua, Hawai'i, awarded to the same konohiki, are labeled as one ahupua'a (spelled "Kapouala") on HGS maps.

<sup>70</sup> For instance, the two halves of the ahupua'a of Honomā'ele in Hāna, Maui, which was divided in the Māhele Book between the government and a kono-

hiki, are labeled as “East Honomaele” and “West Honomaele” on the 1885 map *Maui, Hawaiian Islands* by F.S. Dodge et al. (HGS 1885, on file in Hawai‘i State Survey Division as Reg 1408), as if they were two separate ahupua‘a.

<sup>71</sup> For example, the several ahupua‘a in South Hilo becoming government land in the Māhele, which are collectively labeled “Kaupakuea” after the largest of them on maps, or the similar case of the several government ahupua‘a in North Hilo merged on maps into “O‘ōkala,” both referred to earlier.

<sup>72</sup> This precedence was confirmed by the Supreme Court of the Hawaiian Kingdom, *In the Matter of the Boundaries of Pulehunui*, 4 Haw. 239 (1879).

<sup>73</sup> Carlos Andrade, *Hā‘ena: Through the Eyes of the Ancestors* (Honolulu: University of Hawai‘i Press, 2010); Jeffrey Stover, *The Legacy of the 1848 Māhele and the Kuleana Act of 1850: A Study of Lā‘iewai and Lā‘iemalo‘o Ahupua‘a, 1846–1930* (Honolulu: University of Hawai‘i master’s thesis, 1997); Robert H. Stauffer, *Kahana: How the Land Was Lost* (Honolulu: University of Hawai‘i Press, 2004); K. R. Kapā-‘anaokalāoikeola Oliveira, *‘Olu‘olu ‘o Kahakuloa Ku‘u Kulāiwi* (Honolulu: University of Hawai‘i master’s thesis, 1999); Kaleialoha O Kamalu Lum-Ho, *He Ali‘i ka ‘Āina; he Kawwā he Kanaka. The Land is a Chief; Man is its Servant. Displacement and Population Decline in Rural Valleys: A History of Hālawā Valley, Moloka‘i* (University of Hawai‘i master’s thesis, 2005); Marion Kelly, *Majestic Ka‘ū: Mo‘olelo of Nine Ahupua‘a*, prepared for Ka‘ū Historical Society, Department of Anthropology Report 80-2 (Honolulu: BPBM, 1980); Jocelyn Linnekin, “The Hui Lands of Keanae: Hawaiian Land Tenure and the Great Māhele,” *The Journal of the Polynesian Society* 92, 2 (June 1983): 169–188. :