Don’t look up

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Astronomy and colonialism in Hawai‘i

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One of the largest social movements in recent Hawaiian history took place in the summer of 2019 at the foot of a mountain on the Big Island. This was not just any mountain: beautiful Mauna Kea, a dormant volcano, the highest point of the Pacific Ocean towering at 13,803 feet (4,207 meters) above sea level.

Thousands of people who called themselves *kia‘i* or “protectors” of the mountain braved the cool, windy climate, camping for months on the winding road to the summit. Though the main figures of the movement were *Kānaka Maoli* (Native Hawaiian), it included descendants of the migrant workers from Portugal, Japan, the Philippines and Mexico, who had come to work in the sugarcane plantations and giant cattle ranches in generations past, and who now called Hawai‘i Island (the other name for the Big Island) home ; members of native and indigenous peoples from the Pacific and mainland United States and Canada, who joined in solidarity ; and some residents who had only recently arrived on the island, who demonstrated thus their attachment to the community and the environment.

The *kia‘i* opposed the construction of a new astronomical facility on the summit of Mauna Kea, a cutting-edge instrument called the « Thirty Meter Telescope », or TMT, in reference to the diameter of its primary mirror. Many onlookers, including some of the scientists who used the existing observatories, expressed their disbelief and bewilderment at the protests. Why would one be against *astronomy*, of all things? Wasn’t it a non-polluting activity carried out solely for the benefit of humankind? The *kia‘i* must be antiscience, ignorant, irrational. Social media were blamed for making it easy for them to spread their untruths. The protesters were also certainly opportunistic: or why else would they fight astronomy *now*, even though many observatories had been built on the mountain during the past five decades with no memorable opposition?

Each of the previous allegations is disproved by historical inquiry. Since 2019, I have been working in the archives of the institutions that develop and manage observatories at the summit of Mauna Kea. My research confirms what many old-timers, on both sides of the conflict, told me during oral history interviews: astronomy’s foothold on the mountain is intimately linked to the legacy of colonialism; opposition to summit development started early, when the first large telescope project was announced in the 1970s; and many of the reasons for which the *kia‘i* wish to protect Mauna Kea from further desecration (in their own words) are founded in a long, painful history.

“Discovery”

The first foreign astronomer to set foot on the Big Island of Hawai‘i was none other than Captain James Cook himself, during his third voyage in the Pacific. At the time, astronomy was closely linked to the colonial enterprises: sailors observed the night sky mainly to determine the geographic coordinates of the land which they had “discovered”. As HMS *Resolution* and *Discovery* sailed into Kealakekua Bay at the beginning of December, 1778, thousands of Native Hawaiians paddled and swam out to meet them. Two nights later, the captain observed a lunar eclipse from the coast. Measuring the distance between the moon’s limbs and two stars, he established the precise coordinates of this addition to the archipelago he had named the “Sandwich Islands”. However, Cook met his demise a few weeks later in the same bay, killed in a fight with Native Hawaiians after he attempted to abduct their leader in reprisal for the theft of a small boat.

Fast-forward to 1959, when the Territory of Hawai‘i became the 50th state of the United States. That same year, the first non-stop jet engine connection with the mainland was established. From a businessman’s perspective, the islands were full of economic promise, in large part because of the impending touristic explosion.

Yet on the Big Island, prospects were not so rosy. The profits of sugarcane plantations were dwindling. In 1960, a tsunami destroyed part of the business district of Hilo, the most populous town. A member of the Chamber of Commerce named Mitsuo Akiyama looked up at the snow-capped mountains and wondered: Would there not be a way to put them to some economic use? By building a rocket launching facility, or a factory transforming lava into construction material, or even an astronomical observatory?

The famous Dutch-American astronomer Gerard Kuiper was precisely on the lookout for a high altitude site on which to develop a new generation of infrared telescopes. Invited by Akiyama, Kuiper came with his assistant Alika Herring, a master mirror-maker and observer who happened to be from the island, the descendant of missionaries. Mauna Kea’s summit, which often rose over a sea of clouds, was enticing, but unfortunately it lacked an access road. Hawai‘i’s second governor, John A. Burns, did not need much convincing: barely a month later, a dirt road had been bulldozed through the lava.

In the spring of 1964, Herring spent many weeks alone in the windswept, polar conditions of the summit with what he considered to be his finest mirror of all. He was baffled by what he saw. Craters of the Moon and storm formations on Jupiter appeared to him in unprecedented detail. At an inauguration ceremony for the test telescope, Kuiper enthusiastically announced the news to the scientific community: “This mountaintop is probably the best site in the world – I repeat – in the world, from which to study the Moon, the planets, the stars (...) To use the words of Mr. Alika Herring, our first observer, ‘This mountain is it’. It is a jewel! This is the place where the most advanced and powerful observations from this Earth can be made.”

Conquest

Though it counted very few astronomers, the University of Hawai‘i (UH) was interested. As UH astronomer John Jefferies later recalled, the mountain “could reasonably have been regarded as under Hawai‘i’s jurisdiction”, therefore there was no reason to leave it to outside institutions such as the University of Arizona, which employed Kuiper. The University of Hawai‘i managed to convince NASA to grant it – and not Kuiper’s team – the funding to build a full-size telescope on the mountain. In 1967, Jefferies became the founding director of a new semi-autonomous entity within the university named the Institute for Astronomy. Its main mission was to manage Mauna Kea’s summit in order to develop astronomical facilities.

Telescopes look upward yet they are built on land (with the exception of a handful of space telescopes). Land is a touchy subject in Hawai‘i, a sovereign state which was unilaterally annexed by the United States in 1898, in spite of the petitions signed then by tens of thousands of Native Hawaiians. Adding to the potential complexity, some of the lands on Mauna Kea’s summit and alongside the access road were historically part of the “Crown lands”, which Hawaiian monarchs had previously set aside to benefit their subjects. At the end of the 1960s, though, none of this seemed problematic to the burgeoning State government. The Institute for Astronomy was entrusted with the care of the summit lands via a $1 per annum lease running over 65 years. Jefferies in turn offered similarly priced sub-leases to the astronomical organizations from various countries and universities who were interested in building a telescope on the mountain.

One unresolved issue was the road. In order to attract large projects, the Institute for Astronomy wanted to improve the crude dirt trail by widening and paving it. However, Governor Burns opposed this. He considered a good road would make it too easy for non-scientists to access the summit, and this risked jeopardizing the site's quality for astronomy. In his words to a local journalist, the problem was that "a public road cannot be closed to anyone". At the beginning of the 1970s, Burns even suggested building a cable-car which would make it possible to filter access to the summit; but the project proved too expensive. A compromise unsatisfactory to all parties was eventually reached, which consisted in keeping the road in a permanently semi-hazardous state – to the present day...

Protecting the mountain

The consensus among the first proponents of astronomy was that Mauna Kea was a *terra nullius*. Others users of the mountain did not agree. Environmentalists identified many species of flora and fauna, some of them endemic, which they considered endangered by the construction and operation of telescopes: the *māmane* and *naio* trees, the silversword bush, the *palila* bird, the *wēkiu* bug. Hunters and skiers were also upset at the idea of loosing access to a recreational area that was important to them. In 1974, these different constituencies expressed their discontent prior to the groundbreaking ceremony of the first major project, the Canada-France-Hawai‘i Telescope.

In the following years, new environmental regulations at the federal level gave opponents leverage to at least slow down new observatory projects. However, astronomers always prevailed, especially during a construction boom in the 1980s and 1990s, when many facilities saw first light, including workhorses of contemporary astronomy such as the Keck, Subaru and Gemini North telescopes.

Mauna Kea has always been an important place for residents of the island with Native Hawaiian ancestry, though this was not usually identified by journalists and politicians before the 1990s. In oral history interviews, some *kūpuna* (eleders) describe for example the long-standing tradition of burying a newborn baby's umbilical cord on Mauna Kea. With the cultural renaissance and renewed historical awareness that marked the last quarter of the twentieth century, Native Hawaiian voices progressively joined the chorus of opponents to further development of the summit.

In 2006, a group lead by Hawaiian cultural practioner and former telescope employee Kealoha Pisciotta convinced NASA to cancel funding for an extension to the twin Keck telescopes. In October 2014, a new generation of *kia‘i* interrupted the groundbreaking ceremony for the Thirty Meter Telescope, planting the seeds for the movement that would successfully stave off any attempt to build it until now.

The *kia‘i* I have met are neither irrational nor antiscience. They explain that astronomy is their target only insofar as it mimics the stance of the US military and other capitalist ventures (touristic exploitation, agroindustry...) regarding land use and custody. They also wonder why these multi-million dollar facilities bring so few economic and cultural benefits to the inhabitants of the island. Because of its beauty and its exceptional qualities (upon which astronomers, in their way, agree), Mauna Kea has become the focal point for mobilizations against the colonial theft of land and mindless environmental harm.

The embodied historical knowledge of Native Hawaiians brings them to question the conditions in which, one day, foreign scientists felt entitled to claim an extraordinary mountain as their own, and their own only. Today, many astronomers identify such attitudes as problematic and strive not to reproduce them in their everyday practices. However, the inequalities and injustice borne from two centuries of colonial history will not be easily repaired.