THE OBSERVATORY,

ON THEIR OWN

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In the literature of meteorology, few places have been so frequently mentioned as has the Mauna Loa Observatory as a surface-based site for observations of the earth's atmosphere.

A Special Award was conferred in 1983 by the American Meteorological Society upon the observatory - "for service to the scientific community for providing measurements of the chemical and physical background state of the atmosphere. The continuous records of CO_2 and atmospheric transmission, in particular, are internationally unique and specially important as basic information applicable to understanding climate variability."

This is a story of some happenings and people connected with getting the observatory going.

In 1951, a weather station was set up by the Weather Bureau (WB)[1] near the summit of Mauna Loa mountain on the island of Hawaii. An instrumented building was dedicated there as the Mauna Loa Observatory on December 12. On June 28, 1956, a larger building at 11,150 feet was dedicated as the Mauna Loa Slope Observatory, which in time became known as the Mauna Loa Observatory.

Early history indicates that the top of the mountain attracted several science expeditions and individual scientists. Participants of the First Pacific Science Congress in 1920 went on record as advocating the use of Hawaii's mountaintops for science observations.

Mr. Tom Vance, a tall slim young man who came from east Tennessee to the island of Hawaii to teach school in the 1930s, right away started making first hand investigations on the vast expanses of the island in his spare time. He pored over a big map of the island, planning what could be done. He was thinking about how to better use the land, make its beauty easily enjoyed, and beef up the economy and thus the joy of the people. This he did just for the fun of it and didn't seem keen at all about pushing it upon anyone or getting credit for it.

One of the things that must have so excited him was the great amount of land that the Territory owned. On an early hike over the trail from Puu O'o across the lower slopes of Mauna Loa on the Hilo side to the Volcano area, he dreamed that some day he would be in a position to cause the great resources he found along the trail to be utilized. He found "great ash deposits of deep fertile soil and beautiful stands of koa trees, many of which were falling to the ground and slowly rotting away."

He thought that since aviation was then seen as a crazy venture, public expenditures for it would not likely be recommended for quite some time in the future.

Mr. Ingram M. Stainback, a prominent attorney in the islands, also came from east Tennessee. Mr. Stainback helped Mr. Vance establish the Waiakea Prison Camp near Hilo for the purpose of forming an airstrip[2] by hand labor using only picks, shovels and wheelbarrows.

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1 The WB formed part of the Environmental Science Services Administration on July 1, 1965, which in turn formed part of the National Oceanic and Atmospheric Administration on October 5, 1970. All three agencies were part of the United States Department of Commerce.

2 General Lyman Field later occupied this site.

When the war started, the military took over this airstrip, expanding it, making it a Navy Air Station only to realize that virtually in its center there was a prison camp. This was a time when the military types rapidly moving onto the local scene from the mainland did not realize that the American citizen of Japanese ancestry was such a major element in the island's economy, nor was it realized what an asset they would prove to be in the war effort. Some of Mr. Vance's people were of this ancestry and he received pressure from the military to get them out of the airport area.

With concern for their safety and with his philosophy that if any person is to be retrained to function in society he must be given constructive work and a chance to learn a trade, he set his sights up the slope in the direction of the summit of Mauna Loa to that area where he had seen that rich soil and huge koa trees. It was a long way off and partly through a rainforest. They started out packing in with each cutting the trail with a cane knife.

He said that people thought him crazy to do this for the reason that some of the men had been convicted murderers. It seems that as they trusted him more and told their side of the story, he could usually see it.

They finally made it to the base of the Kulani Cone where the Territorial Board of Agriculture had come in from the other side, up the Puu O'o trail from the Volcano area, and built a pig hunter's cabin to encourage the reduction of damage to the forest by pigs.

Mr. Vance had found that the territorial government's half million acres in the area they had cut through were ideal not only for forests, which could foster a lumber and furniture industry, but the mile high area provided a climate ideal for temperate zone agriculture.

He felt that as soon as the prison industry was thought to be competitive with private industry, there would be a legislation that would be passed to stop the activity. However, they might be safe in their isolation up there, he thought. There were 17 miles of road to be built through dense jungle with little likelihood of special appropriations since it was during war time.

He began by sledding in supplies a short distance, establishing camp, working the road back down, and repeating these steps over again. Mr. Stainback had now been appointed Governor of the Territory and when the commander of the U.S. Navy Seabees requested the use of land for practice in road building to be soon used in the war on Pacific islands and in jungles, he knew just where to send them.

Things were going great for about three miles when a big ohia tree fell on a bulldozer operator. He might have died but the prisoners quickly wrested the big trunk away. The Seabees gave up, but Mr. Vance didn't.

When the immediate threat of enemy landings on the island subsided, some portable barracks that had been used by guard units at various places around the island were left surplus. Mr. Vance obtained and used some of these for his camps as he continued to push up further toward Kulani.

He had many plans and tried to tie them all together. He planned a road all the way to the summit of Mauna Loa with a median strip where he thought all the plants of the world could find a supporting climate.[3] It was to be called the "Gardens of the World." The road was named "Stainback Highway," leaving it open for later jokes about "Strainback Highway."

The reason Mr. Vance gave for choosing Mauna Loa was the resources of the Kulani area. Since Mauna Kea, at any given elevation above 6,000 feet is about five times smaller in area than Mauna Loa, and being of almost equal height, it is easier to see. With great pride, he pointed out how he had laid out the road in several places above Kulani so as to frame Mauna Kea with his great koa trees on both sides of the road. His pride was indeed justified because such an effect accentuated the majesty of Mauna Kea and with a snow-covered top the view was truly breathtaking.

Mauna Loa, with it's almost constant and gentle slope all the way from Hilo to the summit, made road building alluring. Drainage ditches along the roadside were not required in the lava fields since there was good natural drainage.

The fact that Mauna Loa had erupted about every ten years since records had begun and that there was no record, legend, or evidence obvious to the average person that Mauna Kea had ever erupted did not disfavor the selection of Mauna Loa. Indeed, providing public access for viewing future eruptions was an added attraction.

The southeastern slope of Mauna Kea was the Hilo watershed and the Department of Health had regulations concerning entry into the area. A large swampy area existed there at about the 2,000 foot level, where the annual rainfall was thought to be more than 200 inches.

The watershed's southern boundary was used as the alignment of the Saddle Road when it was built by the Army for their use in 1942. In April of that year there was a large lava flow from Mauna Loa toward Hilo that followed the alignment of the new road for several miles.

Mr. Vance, after the war, began to get bites for locating various installations on Mauna Loa, including a site survey team for a large telescope that later went in on a mountain top on the mainland.

1948

Meteorology became a part of the Mauna Loa summit road project when Dr. Robert H. Simpson, the Head of the WB's Pacific operations, made an appointment to talk to Governor Stainback about a plan to establish an automatic weather station on the rim of Mokuaweoweo Crater at the summit of Mauna Loa.

3

A lifetime earlier, a young reporter who became a world renowned humorist had written about Mauna Loa in 1866.

"One could stand on that mountain (wrapped up in blankets and furs to keep warm) and while he nibbled a snowball or an icicle to quench his thirst he could see down the long sweep of its sides and see spots where plants are growing that grow only where the bitter cold of winter prevails; lower down he could see sections devoted to productions that thrive in the temperate zone alone; and at the bottom of the mountain he could see the home of the tufted coco palms and other species of vegetation that grow only in the sultry atmosphere of eternal summers. He could see all the climes of the world at a single glance of the eye, and that glance would only pass over the distance of eight or ten miles as the bird flies."

Of course the Governor had Mr. Vance in his office when Dr. Simpson arrived. He and Mr. Vance instantly became friends and Dr. Simpson then made a special visit to his Washington, D.C. headquarters and gained acceptance of his idea but did not get funds for it.

When he returned to Hawaii, he came up with a loan from the Navy of the two bulldozers that would build the summit road. He also reprogrammed some of his operational funds to expedite urgent matters when they came up. There was a large military surplus stockpile near Pearl Harbor and Dr. Simpson provided Mr. Vance with some fast delivery service on replacement parts that would have been the envy of any commercial operation.

The two of them spent some days together on the sort of go-go-go, bed down at night wherever they were, tempo. On one of these days, Dr. Simpson suffered what may have been a heart attack, was strapped on a bulldozer and brought down to a lower elevation and relayed into Hilo for medical attention.

The need to build a road to the top of Mauna Loa didn't command the funds necessary for ordinary people to do the job. Territorial law did not authorize appropriations for building roads by prison labor, but after some cajoling by Mr. Vance, the legislature allowed him to make labor available to nonprofit community service organizations.

1949

He went to the Lions Clubs of Hawaii and the Hilo Lions was specifically chartered to build a road to the summit of Mauna Loa. The Lions held their convention in Honolulu in the spring and came up with $300 for the project.

With this amount and other Lions Clubs' money and some Mr. Vance had collected by selling small lava rocks from the slopes of Mauna Loa for a dollar apiece to anyone coming into his office, now in Honolulu as Head of the Department of Public Institutions, Territory of Hawaii, he made nine miles of road above Kulani which became a show place. Contractors kept in contact to find out when a machine operator might be up for release so that they could hire him.

Funds were finally appropriated for building roads on most of the islands by Mr. Vance's people. Actually, the inmates began to thin out with so many projects and civil service employees of the group, called instructors, not guards, did most of the work, helping with unemployment problems.

The U.S. Secretary of Interior visited Hilo that year. Mr. Vance so enthralled him with another scheme he had that it was agreed to. This was the double idea of having short ski runs scrapped out on the lava fields up near the summit and having some of the "wayward boys" brought out of the institutions and given Park Service shirts and hats and have them act as ski guides and teachers when the snow came.

This, he said would restore a sense of purpose to these youths. The ski runs were just leveled off places at about 10,000 feet where one could use anything to slide on the snow like an old piece of roofing metal which was stacked for this purpose nearby.

Mr. Vance enjoyed telling of his technique for building the road to the summit. He headed out with a small party aboard the two bulldozers, loaded with bedding, food and other provisions. On the lava fields he sent a man out uphill with a hand-held level. The man keep walking as long as he could

sight back to the crew on the bulldozers.

The machine operators kept the blades up. Their tracks left a fairly good road. They planned to back-blade on their way down and to work over some of the particularly bad spots. For meals and night time rest, they simply stopped wherever they were.

There was a network of lava tubes along the route that the road took. Such a tube results from the flow of lava that courses down a channel between two previous flows and solidifies on top and continues to flow underneath. When the source stops, the last of the lava flows out the bottom leaving the empty tube.

The lighter of the two bulldozers went first and the operator developed a special talent for feeling by the "seat of his pants." Whenever he felt the ground, shake excessively and in a certain way, he jumped from his machine until checks were made.

On at least one occasion the bulldozer fell into a tube after the operator had jumped. This delayed progress only until the crew could get extra equipment and men from the base camp, get the machine out, and fill up the caved-in portion of the road.

Mr. Henry Auwae, an instructor at Kulani, stayed with all the road building on Mauna Loa from the beginning and did most of the work and operational decision making. He said that they were out on the summit road project almost six months.

They started out as Mr. Vance instructed and maintained that slope for about three miles past the 11,000 foot level when it became obvious that they would have to go all the way around the top-of the mountain before they could reach it if they continued with this method.

Mr. Auwae backed up a bit and made about a 100-degree turn to the left (east) and went back across the north face of the mountain for about five miles until the alignment with Hilo was reached and then switched back and forth, picking his own way to the summit.

There were such cracks and awful features that he sensibly gave up on some starts. He tried to skirt close to cinder cones because of the good road surfacing material found there. It is a wonder that they made it without a serious accident.

When they reached the top, a big snow storm came and covered the ground deeply for as far as they could see. They couldn't find their road and might have been trapped, but Mr. Auwae acted quickly and loaded his crew on the two machines and headed direct for Hilo through the snow.

They intercepted their first summit road about three miles down from the 11,000 foot level. This road that they made while coming down in the snow turned out to not only be straighter and about one third the distance as the first, but an all-around better one with an easier slope.[4]

Mr. Vance kept up interest by having a snow festival in a public park by the seashore in downtown Hilo for several of these years. A beauty contest was held and "Miss Snow Hawaii" was crowned. The Lions Club ran the activity. Kulani's "boarders" and staff would leave the summit area before sunrise and race downhill nonstop with dump trucks loaded with snow.

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4 However, the lower half of this road was not used as the way to the summit until after 1964.

This would be a Saturday morning. By the time they reached the park there was enough snow left for all the crowds of kids to play in. Hawaii kids felt left out and cheated because they didn't know what snow was like and yet the stories of wintertime were known to them. They could see the snow on Mauna Kea, but it was inaccessible to most.[5]

The snow festival was always a big hit and the Lions Club held a market day and sold all sorts of things with the money being plowed back into the summit road under the charter they held. Most of all, the event served to establish support for the project from the community and the legislature.

The "Gardens of the World" idea became somewhat sidetracked when Mr. Vance saw that the time was right for his plan for a direct Hilo-Kona road through the saddle between Mauna Loa and Mauna Kea and continuing through the Mauna Loa and Hualalai saddle.

He chose to begin building this road five miles down from his summit road after branching off at the 8,300 foot level and building a road down to a place which he said was 34 miles from Hilo and 34 miles to Kealakekua. [6] Here he built a base camp for this project. This was at the 7,100 foot level.

1950

He spent about a million dollars to build seven miles of straight road on the Hilo-Kona alignment. The work stopped at a "nowhere place" when the camp caught fire one night and burned down.

The community, upon thus learning of this venture, put up such a clamor that no more funds were made available for it. Mr. Vance had not wanted this new alignment connected to the Saddle Road until they were further along. [7]

1951

In addition to Mr. Auwae, Dr. Simpson, and Mr. Vance, the principals were now: Mr. James W. Steiner, Official-in-charge of the WB office which had opened at the Hilo airport two years earlier; and the Superintendent of the Kulani Project, Mr. Charles C. Smith, to whom all visitors should have been grateful for providing transportation, food, and advice on the need for "old clothing, stout shoes," and other necessities.

Positive reporting was so freely used that one expression of interest moved another into involvement and action. An interest by a researcher from the University of California in doing science work in the Mauna Loa area quickly became known as the joint WB-UCLA Mauna Loa Geophysical Observatory at the summit.

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5 Satellite pictures show that usually snow reaches down to the same level on both mountains, giving Mauna Loa about five times as much snow as Mauna Kea.

6 Up until the early 1960s, you could still see his highway sign that said so, in black and white.

7 This four-mile link to the Saddle Road was made thirteen years later and opened on April 27, 1963. Thereafter, this was the route used to get to the observatory, with the road through Kulani not being used for this purpose anymore.

The Hilo newspaper of July 16, said: “The U.S. Weather Bureau, the University of California at Los Angeles, the National Park Service and the Territorial Department of Public Institutions are cooperating for the establishment of a unique weather research observatory atop Mauna Loa. The observatory eventually is expected to enlarge understanding of the physics of the air, and carry on experiments at the behest of scientific groups all over the world.”

Dr. Simpson thought that as many as fifty people might be hired to work permanently there.

On September 6, a WB party from Honolulu picked the site at 13,456 feet. The promise of funds expected from the U.S. Air Force Research Department at Cambridge in “direct support of defense research and development projects” which were to go to UCLA, had been used to get more of the road work done. These funds did not materialize in Hawaii.

The threat of snow was then used to get the road in shape before more funds were lost.

On September 13, the WB Central Office provided $500 for construction of a plyboard building. Some equipment was provided, but no personnel were made available to change the autographic charts.

Dr. Simpson began to raise excitement for opening day which he planned for December 12. The Secretary of Interior and five congressmen were invited, and plans were made to charter a plane for the trip over from Honolulu.

Neither the Secretary nor the congressmen could make it, but the Navy was reimbursed $270 for the use of a plane which brought over other invited dignitaries. Dr. Simpson started the logbook and described the day as: cloudy, temperature 32°F, wind SW 15 mph with occasional snow flurries.

Altogether about fifty people were present and a fabulous barbecue cookout was said to have been held at the site. Mr. Smith, who provided most of the labor and worked out the logistics details, said: "Hell, this place is so high and cold that I can boil water for coffee all day and stick my hand inside it and not get burned."

The summit of Mauna Loa had erupted the year before with a major flow reaching the sea to the southwest. The Head of the Division of Territories, U.S. Department of Interior, had given the dedication address, and wrote his report of the trip after he and his wife returned home to Washington, D.C.

"It was the most awesome experience of my life. I was a witness to the continuing process of creation. I became aware of the fact that I was traversing an area where my Creator had been only yesterday. I was troubled by the thought that He might suddenly return. If so, what should I do? Should I introduce myself and what should I say? Washington has protocol for almost every circumstance but not for such as this. Admiration for our Creator grew as we realized that He had created this beautiful universe out of desolation such as this. We did get some relief from this horrible picture of utter desolation when we entered the snow-capped summit area but when we looked into the huge crater we got a picture of the violence which had created this great mountain. Unfortunately, steam cracks were melting the beautiful snow cover and exposing the frightening picture of desolation. As we came back into the beautiful forest surrounding the prison camp and saw smoke rising from the chimneys of the camp, I breathed a sigh of relief, 'home at last'. I never realized that a prison camp could look so good. I'm glad that I made the trip but I am even happier that I am not one of those who will be making the trip daily in the interest of scientific research. This awesome experience will doubtless become an interesting and pleasant memory, but it will take quite some time to recover from the initial shock."

Autographic equipment for recording wind speed and direction, temperature, humidity, rainfall and pressure had been installed. There were three other stations along the road up from Hilo where data were to be obtained. These provided temperature, humidity and rainfall recordings. These stations were named: Kulani, at 5,180 feet; Kulani Mauka, at 8,300 feet; and Mauna Loa Slope at 11,000 feet.

By mid-January, at the summit, the wind mast had blown down and the instruments had succumbed to stuck paper and ink problems.

Dr. Simpson asked Mr. Steiner to report by dispatch to Honolulu any and all information about each trip so that all items deemed of public interest could be included in the next morning's weather broadcast from the Honolulu forecast office over a commercial radio station.

The Hawaii Island Chamber of Commerce offered to assist with getting funds appropriated for the project. Dr. Simpson, responding to the Chamber's Executive Secretary, said that the observatory was of immediate importance to forecasting and use in researching the structure and behavior of the tropical atmosphere.

He stressed the need for finishing the entire road so that the trip would not be so grueling and time consuming for the scientists. He also said that he envisioned a laboratory and living quarters at the 9,000 foot level where they could maintain a permanent residence with their families.

Dr. Harry Wexler, [8] Director of the Office of Meteorological Research (OMR)of the WB's Central Office, referred to the development as the new observing network of stations on Mauna Loa. He described the network being at sea level, 4,000, 5,000, 8,300, 11,000 and 13,453 feet.

In April, Mr. Steiner, making the trip to the summit with an official visitor aboard, had engine trouble on the way down and abandoned the truck at 12,000 feet. They walked down to the 8,300 foot level where the CAA (later FAA) had a transmitting station. They found the building locked and walked on down to be met by Kulani people at about 9:00 p.m.

The next morning the Park Service, who had been alerted, found the truck, had no trouble to start it and drove it down to Hilo. Mr. Steiner made an attempt to stem the flood tide of suggestions for emergency procedures - radios, safety equipment, liability insurance coverage, workers' compensation, and on and on. He alluded to the point that the visitor had gotten overly excited.

By May, emergency gear had been obtained, physical examinations at six month intervals for all employees making the trips were provided for, and a form was drawn up and needed to be signed by all non-employee passengers, freeing the WB from liability. Trouble with the instrumentation continued.

8

Dr. Wexler became known as the father of the meteorological satellite. The first "weather picture" from space was obtained on April 1, 1960.

Mr. Gordon D. Cartwright, about to come out from Washington, D.C. to replace Dr. Simpson who was moving on to start up the Hurricane Research Center in Miami, visited and wrote the Chief of the WB on August 21. It was all about the Mauna Loa development and in the style of the times he made it seem that he was trying to sort facts from something less without stepping on any toes. At the same time, he offered visions of his own.

1953

After two years, it was seen as a strain on the ever willing staff at Hilo to keep up the trips past the end of this year.

1954

In January, Mr. Cartwright wrote to the new Territorial Governor to solicit more effort for the road. He said that the wonderful science would have to be stopped if the road was not maintained.

The Territory had spent about $100,000 for the road above 10,000 feet by then and had not gotten very close to either the"Gardens of the World," a "snow road," or a drive-in volcano, not to mention the employment opportunities that had been expected. The manned observatory at the summit from which Dr. Simpson had hoped to see the mysteries of the "Kona storm" unraveled had to be held in abeyance.

By April, Mr. Roy L. Fox had become the Meteorologist-in-charge of the Pacific Supervisory Office, WB, in Honolulu. The Air Force had asked if a project of air sampling could be done for them on Mauna Loa. Mr. Fox came up with a seven-page letter evaluating the proposal.

He presented suggestions for worthwhile additional observations to be made simultaneously "on our own." He felt that the job would be difficult but should be tackled, stating: "that headaches usually go away in time, and if the anticipated gains are continually kept in mind, annoyances and inconveniences are more easily coped with."

One man was to be left at the 9,000 foot level while two others journeyed onto the summit each day that the air sample was to be taken. Mr. Fox made some cautions about providing a shelter for the man left alone, as well as a Coleman burner for heating food and that radios should be used. Costs for setting up the project were estimated at $18,000.

He recommended that Mr. Raymond G. Busniewski, of the Hilo staff, be in charge with two assistants hired locally and that Mr. Busniewski's slot on the Hilo staff be filled with a man detailed from elsewhere within the WB.

One compressor was to be operated at 8,000 feet and another at 11,150 feet, filling six-liter steel cylinder tanks with air. The Navy diverted to this project 240 empty tanks that had held helium used in their weather balloon work in the Pacific in exchange for eventually getting them back to their Lakehurst, New Jersey air station.

Mr. Saul Price, WB research forecaster at the Honolulu airport, came over to Hilo to coordinate the meteorological measurements that they needed to carry out during the Air Force project. The

program started June 1 and was to last for about four months. The Air Force gave the WB $10,000 to do it.

Mr. Price kept up the pressure to get more data. It would be "very interesting," he said. "It will take more than a little effort; however, we would be seriously remiss not to take the fullest advantage of this rare opportunity." The Oahu Research Center was going to make similar observations on the slopes of Haleakala on Maui and this "tremendously increases the interest and value of the data," he said.

One trip had an observer sitting on foam rubber on top of the truck holding in his hands an aerometeorograph, a weather recording instrument normally flown on aircraft. The truck went over a rough place in the road, dumped him into the lava, and gave him cuts and bruises. However, he was able to save the instrument with only splashed ink destroying the record.

Hawaiian Air Line personnel were talked into the free use of a forklift and an operator to load the cylinders onto the C-54 plane which came over for the pickups. Once a stewardess hand carried a barometer over from Honolulu.

There were stations at the following elevations in feet: 1,000, 3,700, 5,181, 7,030, 8,300, 9,300, 10,080, 10,958, and 13,456. By September, Hilo reported that the Air Force project could not be continued if the weather stations had to be tended.

On October 8, the project ended with the compressors, manifolds, and the three flying suits being shipped back to the Air Force.

From October to December, the Office of Naval Research funded an effort in cloud physics studies on the island. It was known as "Project Shower" and brought together people from several groups. Tellus published a collection of the papers which resulted.

1955

In February, the WB offered $520 a year salary and $450 a year expense for anyone to service the stations along the mountain road once a week. There was interest in such a job by both men who had been hired for the Air Force project, but the airport WB staff wanted to make the trips on a paid overtime basis.

In June, Dr. Simpson, who seemed to visit Mauna Loa each chance he had, was then visiting in New Mexico. There on Sacramento Peak he found Dr. Ralph Stair making measurements of the solar irradiance for the Bureau of Standards.

Dr. Simpson spared no time in telling him about Mauna Loa. Dr. Stair expressed keen interest to do his work there but wondered about finding funding for such. Dr. Simpson agreed on the spot to divert $30,000 from his National Hurricane Research Project if the Bureau of Standards could use it to construct a building on Mauna Loa.

. This commitment was justified to obtain ozone observations which could provide "some clues concerning the development of cold core lows which move across Hawaii and later become a source from which typhoons develop."

Dr. Ukichiro Nakaya of Hokkaido University, Sapporo, Japan, visited the Honolulu WB office in September to discuss a snow study at the summit of Mauna Loa for the next winter for which he was obtaining funding from the Geophysical Research Directorate in the United States. He became enthusiastic about living in the summit observatory building with two others for the entire winter.

When Mr. Busniewski heard of this, he pointed out that the 8' X 10' shack there was not at all adequate. He outlined the array of arrangements that needed to be made before a project like this could be undertaken. He proposed the use of the larger more sturdy Park Service cabin on the east-southeast side of the crater.

Dr. Stair first arrived in Hilo on December 12, after having satisfied himself through discussions with officials in Washington and elsewhere that he knew just what he could do. Before Christmas he had picked the site at 11,150 feet. This was just below a steep grade in the road where ground up lava pieces were so loose and deep that traveling further up the slope was unrealistic. He didn't get into road building.

He obtained the grant of the four acres of land from the Territory and had it surveyed. He went to all the building supply houses and rummaged around in their warehouses. He had the talent to remember what he found and in particular any items that he felt the company might sell at a reduced price.

Then he drew up complete plans and specifications matching what he had found. A construction firm, long in Hilo, Glover, Inc., agreed to level the plot, build the building and a concrete pad for $14,000. This included a water storage tank and a roof catchment system, wiring for electric lights, a tower platform and outhouse.

1956

January found Dr. Stair back in Washington with Mr. Steiner and the local companies caught up in his enthusiasm and putting out a lot of work "on their own," detailing the project's development.

The Kulani people were involved since the only access by vehicle to the upper reaches of the mountain was through the camp, which had become known as the Kulani Honor Camp. Although the area was not enclosed, there were several cattle gates one had to open and close and there was one control point which was manned around the clock. They knew what was going on up the slope and about when to expect return trips down.

Mr. Vance became the administrator of Maui Memorial Hospital. Mr. Smith was still the Superintendent there at Kulani and was entrained in the excitement of the "up the slope development" and did much work on short notice or "on his own."

An extensive water catchment had been developed just above the camp that Mr. Vance was very proud of. From here came the water needed at the observatory. First it was hauled up by Mr. Smith's men and later by the observatory staff.

Some corners had to be cut short to make the $30,000 complete the self-supporting project that Dr. Stair wanted as his part of the overall plan. He was aware of all the barely essential considerations. He was careful not to belabor any points or to dump any moot problems on anyone. He felt of the venture as jointly Bureau of Standards and WB, both being Department of Commerce agencies.

He set up three experiments to take place when the development was finished. The first was a study of the atmosphere of Mars, to be carried out by the Bureau of Standards scientists and funded by the National Geographic Society. He expected them to add an amount of incidental equipment in appreciation for their use of the observing facility.

The second was to be an infrared study of the water vapor along the line of sight to Mauna Kea to be carried out by the Office of Naval Research.

The third was for ultraviolet measurements of which he would be the principal investigator.

Dr. Stair sent out two link radios for transmitting and receiving. The power was 50 watts. He obtained the frequency assignment of 162.955 MHz for the Bureau of Standards from the FCC on May 1. A complete set of fire extinguishers and first aid equipment was put in place.

Mr. Fox stuck by his goal of planning a WB observational program to begin the next year. He recommended that his office provide administrative and maintenance support. He felt that for this, the project should pay for half the salary of a clerk in his Honolulu office.

He favored a staff of three people at the observatory - one GS-9 and two GS-7s. Each would spend two weeks continually at the mountain, with each week having six days paid and one day as compensatory time off.

His yearly costs were estimated at $35,000. A program of synoptic observations was to be the core of the work. The men would work out their own arrangements for buying and cooking their food, “on their own.”

The construction company did quite a bit “on their own,” innovating from the plans where they thought that Dr. Stair lacked local experience. They finished the building and furnished it for a total cost of $25,000. It was ready by mid June.

For the construction workers, it was rough going since they camped overnight. Their comments were that it was “something different” but that “one time was enough.”

Publicity for the study of the atmosphere of Mars took the form of headlines both in January and July that read: “Study May Show Whether Life Exists on Mars.”[9]

Dr. Stair sent word to Mr. Fox that the four member parties would be arriving in Honolulu on the steamship President Cleveland, and that he should have a welcoming committee at dockside. The arriving group consisted of Dr. and Mrs. C.C. Kiess and Dr. and Mrs. Charles H. Corless, all of the Bureau of Standards and recently wedded.

Mr. Steiner and Mr. Busniewski had setup meteorological equipment including a wind and a sunshine duration recorder using a 6-volt battery trickle charger system. The military as well as private

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9 These headlines could have been reused twenty years later about the Viking space missions.

citizens were called upon freely to come up with transportation, food, drinks and even electric generators and refrigerators for the opening day ceremony. Guests were invited, hotel reservations made and official programs were printed.

Dr. Stair arrived in Hilo on June 20 to check out the facility and the preparations. He said that he just managed to finish hooking up the water collection tank to the hot water heater and the kitchen sink, “on his own,” late in the evening before the opening.

That day, June 28, a caravan of fifteen automobiles carrying 77 people, including the Governor, headed up the slope.

There was TV coverage. The Honolulu Star-Bulletin carried a three-part series on the event. One paragraph, about two women from a church in Hilo, who opened the ceremony, speaking in Hawaiian, read: “Gracious and lovely, silver haired and sweet, they invoked God’s blessings on this study of God’s handiwork in the heavens.”

The astronomers extolled the virtues of the site for night time observations. Dr. Simpson related at a subsequent science meeting that not only do the low clouds drain off the mountain after sunset, but also, if there is a high cirrus cloud cover, a viewing port will be made in the layer by the downward pull of the mountain air drainage.

Dr. Kiess said that the water-collection from the roof was substantially increased due to condensing of moisture on the cold roof.

The couples seemed to have had a grand time and in particular they tried out all kinds of canned gourmet food they had purchased since the National Geographic Society footed the bill.

The study resulted in publication in the Astrophysical Journal in November of the following year by the four of them. A concave-grating spectrograph was used to try to find the existence of water vapor and oxygen in the atmosphere of Mars. The result was negative but they indicated their belief that another technique which they then suggested might be better used.

Dr. Harold Yates with the group from the Office of Naval Research arrived to measure water vapor in the line of sight to Mauna Kea. The Bureau of Standards group had not yet left. He would have used the window in the main room facing Mauna Kea for his work but would have had it open at night. This would not have suited the comfort of the couples still living there.

The platform tower had been built to the east of the building so that it was possible to have a free flow of air beneath it. Dr. Yates, in need to get his study started, enclosed the space beneath the tower with a roof, floor and sides. He then had his view of Mauna Kea through a square cut in the north side of this structure that he had added.

Dr. Walter R. Steiger, a University of Hawaii physicist who was interested in astronomy, was the university’s link to the mountain activities. He had been able to get going on Maui - on Haleleakala - of just more than 10,000 feet in elevation. Here again it was Mr. Vance and his Orlinda Prison Farm on that island that got the road started. The Park Service came into the road building process early and the place was soon known as Science City.

Dr. Steiger was, more frequently than he wanted, pressured into investigating the possibility of having research projects set up on Mauna Loa. He visited in June looking for a cosmic ray monitor site for the International Geophysical Year (IGY). Consideration for logistics was the reason he gave for locating this work at Makapuu Point Solar Observatory on Oahu.

On October 19, the headline in the Honolulu Star-Bulletin read: "Island Station to Track Earth Satellite." The paper went on to say how the University of Hawaii was to direct the project on Mauna Loa. Dr. Steiger saw the news as embarrassingly premature and when he finished his study, his decision was that the weather conditions were good enough on Maui and that the logistics were so much easier there than on Mauna Loa.

During this academic year, an internationally known oceanographer from Sweden was visiting scientists at the University of Hawaii. His interest was in tiny magnetic spherules of a unique iron-nichel alloy. These were thought to have originated from meteoric dust settling to earth. He and Dr. Steiger made several trips to Mauna Loa, thinking to collect dust samples there to help to solve the problem of the accretion rate.

Dr. Steiger said that even with the cleanliness of Mauna Loa's air, there still was enough dust to mask the meteoric portion. These trips were made during the time when the station was unmanned and a locked chain at the 8,300 foot level supposedly secured the area. Dr. Steiger expressed the need for a mirror in the kitchen for shaving and an electric light in the outhouse.

It was during this winter that the scientists from Japan came. They made an extensive study of condensation nuclei and snow crystals at the summit of Mauna Loa. Many physical feats that were thought by many, before and after, to be impossible were done by these hard working happy scientists.

They lived that winter in the new structure at 11,150 feet, but walked, and some say ran to the summit as frequently as days on end. Dr. Wexler visited during their stay and worked some with them.

An illustrated report of this work became contribution No. 1, of the Hawaii Institute of Geophysics of the University.

The WB considered the installation of secondary importance. They wanted to get to the summit. The lower unit lay outside the National Park boundary, the upper one within. The Park Service voiced their clear opinion that they would not look with favor on an improved road to the summit.

Problems such as noise and vibrations from the generator which was installed beneath the water tank were brought up by visitors. Mr. Steiner and Mr. Busniewski established sets of rules governing activities and obligations for users. Plans and suggestions for operating the observatory continued throughout the rest of the year.

1957

January found Mr. Steiner leaving for a new assignment and Mr. Busniewski put in-charge. His work on the mountain continued with the building of a generator shed, the installation of two generators

and a diesel fuel tank. He replaced the gas space heater with an electric one. All this was done mostly "on his own."

There was frequent trouble with the Dodge power wagon. Sometimes the trip was made in a vehicle Mr. Busniewski borrowed from someone in the community willing to help the observatory. To most of the airport staff the trip was a nice break. It was not so often as to be a hardship. Some used it as a picnic outing for their family.

Dr. Stair, planning to make ultraviolet solar irradiance measurements in May, asked for cloud cover observation data. He was told by the Honolulu WB office that there were once a day visual observations at the summit every three or four weeks for a period of eighteen to twenty months. From the 11,134 foot elevation there were records of weekly intervals for nearly three years.

On March 14, Dr. Wexler wrote a memorandum to the Chief of the WB with a layout of equipment procurement, personnel needs and costs. He said: "During the IGY one of the Weather Bureau's most important research programs will be the observational programs at Mauna Loa. The Observatory has attracted considerable interest here and abroad and already noted scientists have taken advantage of the unique location and facilities."

He set the costs for the fiscal year beginning July 1, at $20,000 and asked for early approval, since time was running out.

Dr. Stair made many improvements to what was actually a bare concrete structure during his short stay beginning in late May. He brought a good technical library including hard bound annals of the Smithsonian Institute, detailing their solar constant work. He published a paper on atmospheric transmission in the ultraviolet as a result of his study.

On June 12, Mr. Fox was written a letter by the Deputy Chief of the WB stating that
Mr. Jack C. Pales of the WB's Physical Research Division in Washington, D.C., had left the Central Office to assume the duties as Physicist-in-charge of the Mauna Loa Observatory for the duration of the IGY. Mr. Robert Williams of the WB Research station at Las Vegas, Nevada and Mr. Clifford Kutaka of the Honolulu WB office had been asked to serve as assistants as soon as their transfers could be arranged.

Mr. Fox wrote Mr. Busniewski that he and his staff could discontinue their weekly trips "up the mountain" until the end of the IGY. The Dodge power wagon was to be turned over to Mr. Pales and furnished office space was to be made available to him and his staff at their airport office in Hilo.

Mr. Pales, yet another tall slim southerner, arrived on June 21. The airport weather people made their last trip on July11.

Honolulu proclaimed the Mauna Loa Observatory a first order station which should take surface observations exactly as prescribed in Circular N, the observer's "bible," and all the standard forms should be completed and sent to them. The climate stations were transferred over to Mr. Pales.

Mr. Price said that up to this point, few weather observations of value had been taken on the mountain and that he would, "on his own," install an all-sky camera to answer the questions of how much cirrus cloudiness was created by the mountain and what happens to the temperature inversion near the surface of the mountain. He went on to suggest many fine studies.

It sounded like OMR was giving a minimum amount of money for the IGY work and hoped that

the Honolulu people might get excited enough about the observatory to divert, from some place in the Pacific, funds for running the place. OMR said that scientific exchange and direction would be direct between the observatory and OMR.

The Central Office said that the new installation was the Weather Bureau Mauna Loa Observatory and that it had no public service responsibilities and therefore was not a first order station but should be treated as one administratively. Although Mr. Pales received a five-page program letter from the Chief of the WB, it contained several misstatements of reality.

Mr. Pales got chided by the Honolulu office for each purchase he made, no matter how small. They were accustomed to a tight budget and all the field stations were so carefully watched and could be so easily compared one with the other that officials at the stations never thought of making purchases. Everything was standard and routine and the necessary supplies and equipment came at regular times because of the established bookkeeping procedures.

Mr. Pales, coming from a research laboratory, was accustomed to freer spending. He wrote that there were enough dishes, linen, and chairs for twenty people, but he said, “I wouldn’t want to hurt anyone’s feelings, but the observatory was built with absolutely no planning for anything.”

He and his two men, having worked long hours, expected to receive overtime pay because this was his understanding when he left Washington. When he reported it on the time and attendance forms, the extra pay was denied. Honolulu said that the authority to grant overtime pay had not been given to them.

All three men were mature professionals who were highly experienced and well trained. Equipment arriving occupied a great deal of time. When the equipment worked, little time had to be spent on it. The ones that didn’t work took so much of their time.

The two observers were zealous in their work and made surface observations that quickly became a standard airways program. If there had been a big busy airport there in the lava fields, it would have been well served.

In early November, Dr. Simpson visited. The equipments operating at that time were the Regener surface ozone recorder, direct incidence solar pyrheliometer and recorder, weighing rain gage, Naval Research Laboratory radioactivity filter apparatus, and the micrometer collector with millipore filters.

Total hemispherical and net exchange radiometers were installed as well as a horizontal incidence pyrheliometer but these were awaiting recorders. The Dobson ozone spectrophotometer needed a better power supply to operate. A theodolite was installed for making balloon observations for wind speed and direction aloft.

Considerable effort was being made to obtain copies of the synoptic weather maps so that the observations could be explained. The great effort was to get a carbon dioxide measuring program set up with the Scripps Institution of Oceanography and to get some freezing nuclei measurement going “on their own.”

In addition to all these programs, Mr. Pales felt that many other special projects must be started “on his own,” such as a wiresonde study with a large tethered balloon.

The first solar radiation records were filed with the Records Center for November. Dobson total ozone records had begun continuously.

The three men worked so that the observatory was manned all the time. Each stayed for five or six days with only one day off the mountain each week. Even their day off was never free of observatory business. All holidays and weekends were worked.

All three made tabulations, analysis, and various graphic presentations of their observations, "on their own." They were ever up to selling the usefulness of their effort. Mr. Price, for whom Mr. Kutaka had worked, was sent many of these products. Right away there was pressure to get them in as soon as possible. This work was kept up to date daily and all the previous months' observations were finished and copies in the mail no later than the second of the month.

There was particular pride in and much use made of a continuous plot along a common time base of all hourly average values reduced from the records and of each and every observation made. Ordinate values were clearly indicated and both standard and creatively designed symbols were cleverly used. This record was maintained meticulously on a continuous roll of chart paper which was finally neatly and appropriately folded.

Work was scheduled from before sunrise to after sunset. Ozone observations were made on the moon by alternating men throughout the four nights across the full moon. All ozone observations were reduced to ozone values within minutes of each observation by use of tables of logarithms and a current epemeris.

Mr. Pales stated that if either of the two assistants felt that they needed rest, recreation or to do personal work beyond these hours that he could not justify asking them to do more. He averaged less than three hours of sleep a night and worked hard all of the other hours.

Dr. Yates returned to continue his work for a couple of weeks.

The Army Map Service planned a set of stellar observations to tie down the exact location of the Hawaiian Islands with respect to the mainland. They promised to leave a bronze marker flush with ground level, marking the spot of their observations. Actually they built a concrete column about four feet high, with the marker on top.[10]

Dr. Wexler visited on December 29. Mr. Pales was able to get him to okay twenty-four hours of overtime pay each week for each man. It was as though all the questions about ozone would soon be answered. Dr. Wexler was very pleased.

The carbon dioxide equipment had not yet arrived and there was trouble with the freezing nuclei counter. There were two Fairbanks-Morse diesel generators of six kilowatts each and a ten-kilowatt gas engine. Besides the Dodge power wagon, a new all-wheel drive International Carryall had been purchased. All caused quite a bit of trouble and the road needed repairs.

1958

Mr. Pales followed up his conversation with Dr. Wexler with a letter on January 7. He told that the carbon dioxide program would require an additional hour each day to "work up" the data and because of this he felt that he must hire another person.

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10 Probably the work was not successful because there are no data available on the marker.

He recommended that his wife be hired as a GS-5 to run errands in Hilo, do secretarial work and reduce data. He said that this would greatly free him to do more work, save the government travel money and most importantly; “tie us to the observatory.”

He explained this further by saying, “The advantages to both me as Physicist-in-charge and to the Bureau are overwhelming . . . “ for continuing the project past the IGY.

He asked for $700 to equip space in his home for an office and said that he would move out of the airport office, radio link and all.

Dr. Wexler’s first letter after his return home was dated January 8, and said, “. . . how impressed I was with the ship shape appearance of the Mauna Loa Observatory and the high enthusiasm of yourself and observers. You have been doing an excellent job with slender resources at the end of a long pipeline.”

He said that what would be needed to keep the observatory open past the end of the year would be good research results and suggested that he team up with Mr. Price to achieve this. He kicked in $250 for Mr. Smith to repair the road.

Mr. Pales’ hobby for a number of years had been photography and copies of printed material were then made by enlarging a picture taken with a reflex camera. Dr. Wexler’s opinion was that he should have the equipped darkroom he had requested.

One of Mr. Pales’ complaints had been checked out and it had been found that of his ten letters to a solar radiation expert in the Central Office since September 13, nine had been answered which had taken a lot of time. Dr. Wexler thought that this was quite a good record and that the complaint was not valid.

The “end of a long pipeline” made a nice bin for throwing an assortment of unsolved problems into.

On March 8, Mr. Pales reported, along with several science findings, that the outhouse had blown over in a 65 to 85 knot wind two days earlier.

By April, Dr. Wexler had written that Mr. Ronald Taylor, who had wintered over at the Little America Central, Antarctica the year before would be detailed to the observatory for about four months.

Mr. Fox left for a new assignment on April 3 and Mr. Colby Foss was transferred from Honolulu to the observatory.

Dr. Wexler advised Mr. Price to have patience with Mr. Pales and the observatory - that it would take time to work up a proper relationship.

A new International pick-up truck replaced the Dodge power wagon. Mr. Foss got a full time radio network in operation. Dr. Wexler furnished the call letters for the Carryall as “KC-6211,” and for the pick-up, “KC-6223.”

All surface observations were called down to the airport WB station within seconds after each observation at hourly and at shorter intervals as required by their interpretation of the airways manual.

A big TV crew for a program called “Life of the Land” made a film of the observatory and the staff.

A staff memo by Mr. Pales on May 23 outlining the duties gives some flavor of these times.

Williams:

1. Maintenance of vehicles and execution of truck logs.
2. Solar radiation program. (Data reduction, forms and calibration).

3. Air sampling program. (Micrometer and radioactivity)
4. Freezing nuclei progam

Kutaka:

1. Water and fuel oil supply.
2. Surface observations, operations record.
3. Surface ozone. (Records, calibration)
4. Cloud photography

Taylor:

1. Laundry, distilled water, helium.
2. Atmospheric ozone (forms, calibration)
3. Carbon dioxide program. (Forms, calibration)

Mr. Williams had a hi-fi system that Mr. Kutaka didn’t always enjoy hearing. By July, Mr. Williams wanted out at the end of the year. Mr. Kutaka wanted to stay through the fiscal year. Mr. Pales didn’t want Mr. Taylor replaced after his stay was over.

Mr. Pales defended a request he had been denied to visit Washington, D.C., saying that it was for technical help and not for personal reasons.

Scripps wanted to get the University of Hawaii to do the carbon dioxide measurements on Mauna Kea and held up on turning the equipment over to the WB even though OMR had funded its development.

When Mr. Nels Johnson became Head of the Pacific Supervisory Office of the WB in Honolulu and visited the observatory, he seemed a little cooler than previous Heads toward the observatory concept and mainly commented that the walk to the outhouse was pretty rough going. Wooden walkways were built and laid over the lava along the main routes of travel and that helped a lot.

By September, Mr. Johnson advised that the observatory function would be moved to Haleakala on Maui. Mr. Pales fought against this move and won out, using as his main argument that the 8,000 cars per year reported driving up Haleakala would preclude the carbon dioxide benchmark measurements from being made there.

Mr. Pales, in his mid thirties, was active as a lieutenant commander in the Navy Reserve. He also gained the leadership of several organizations which excluded all but a small local representation of an ethnic stereotype in which he felt tradition placed him, in the accepted social structure of the provincial town that Hilo was in those days.

Dr. Wexler visited again in December and reported back to the Chief of the WB that Mr. Pales wanted to stay on for two or three more years before getting on with his graduate studies, since he wanted to use some of his findings for his thesis.

There were no better options for Mr. Williams at the end of the year and he asked to stay on for eighteen more months.

IGY was over.

A one year program for an atmospheric electricity benchmark measurement to be conducted by another research group in the WB and to be funded by the National Science Foundation was in the plans.

1959

Mr. Foss was able to obtain a large warehouse type space at the southeast end of the Freight Terminal Building at the airport for the use of the observatory. He partitioned it into first class offices and work areas and on April 15, it became the Hilo Office of the Mauna Loa Observatory.

The carbon dioxide program was up and running and two new GMC generators of 35 kilowatts each were working. Mr. Pales at this time asked for two more positions.

The ongoing programs were:

- Surface weather observation (0700-1700)
- Atmospheric ozone observations
- Surface ozone measurements
- Freezing nuclei counts
- Carbon dioxide measurements
- Radioactivity by air filter collection
- Time lapse photography
- Solar radiation observations (normal incidence, total sun and sky, and total hemispherical and net exchange)

The expected programs were:

- Atmospheric electricity measurements
- Condensation nuclei counts
- Turbidity measurements
- Cloud droplet size distributions
- Infrared hygrometer development
- Expanded freezing nuclei counts
- Expanded surface and atmospheric ozone measurements and Umkehr observations
- Expanded carbon dioxide measurements
- All sky cloud photography.

Mr. Price and Mr. Pales published a report on the observatory in the Monthly Weather Review and were working on several other papers.

Kilauea volcano erupted frequently and there was the not to be denied call to go to measure something "on their own" there.

Mr. Williams obtained a position with the Pacific Weather Patrol. At lunch, the first day his replacement was on the mountain, it was revealed that he did not drive and was not willing to learn. So, Mr. Pales would not keep him and Mr. Williams had to wait until June when another replacement came from the mainland.

The four-member atmospheric electricity group arrived in August and began their work in a small room they attached to the rear of the Dobson shed. A few months later they built a large Butler building for their work to the east of this shed.

The four were from the same laboratory in Washington, D.C. from which Mr. Pales had come and they integrated well into the life of the observatory. They purchased their own vehicle, however, and maintained their own work routine and schedule of trips up and down the mountain

The extra positions did not come through.

The constant noise and strain of the generators seemed to typify the high tempo of the place.[11] There was a lot of radio traffic now and enough trips up and down the mountain for the outfit's function to have appeared as that of a transportation company.

When traveling up and down the road, a strict system was rigidly adhered to. Five locations along the route had been selected for their good radio coverage and upon passing each location, contact had to be made with either Hilo or the observatory as assigned. Drivers did not continue until the contact was made and another vehicle went looking if a reasonable time passed without a driver calling in.

Former Governor Stainback was a widower now and was old and willing to provide some personal funds for his monument, the road bearing his name.

Hawaii had become a state on August 21.

About Thanksgiving, Mr. Pales began with his usual high resolve to perform a calibration on the Dobson spectrophotometer No. 63. This was done by making as many observations on the sun as possible, particularly at low sun. He worked fast and used an assistant to write down the readings as he called them out. At night he would plot the data on large sections of millimeter graph paper laid out on the spotless red tile floor of the main room.

1960

New Year's day dawned bright and clear with Mr. Pales and one of his observers making the Dobson measurements. When they were moving the instrument about on the original cart designed by the inventor of the instrument, two diagonally opposite wheels came off. The heavy instrument fell to the concrete and was damaged.

All the hard work of the past weeks was now of no avail. The instrument was shipped back to Washington for repair and it was about one year before it was returned.

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11 Commercial power was hooked up eight years later on July 21, 1967 at 1500 hours.

A third observer, one transferred from within the state, reported for duty on February 7.

Mr. Williams' second replacement, young, newly married, and valiantly acclaiming great good fortune in being assigned to Hawaii but without either him or his wife finding local links back to their familiar culture, began to "act up" on the mountain. The other two observers feared for him but Mr. Pales said that he never observed anything wrong with him, saying he was a good worker.

When, upon returning to the mountain after being allowed to stay in Hilo for a while, he had to be talked out of shooting himself in the foot to get off the mountain, he was transferred.

A solar radiation specialist who was working in Washington, D.C. transferred to the observatory.

During a two-week period in April, scientists at many locations around the nation were surprised, when upon answering their telephones, they heard the sound of coins being placed into a pay telephone. It was Mr. Pales, who had been granted a trip back to Washington, D.C., calling with his own coins from various places to drum up projects for the observatory, following some leads he came across, just as would have a hungry salesman.

He scored best at the U.S. Army Electronics Proving Ground, Fort Huachuca, Arizona where he soon after put together "on his own" a program to measure solar radiation, dust, ozone and surface weather at both Hilo and the observatory for eighteen months. This was justified by the general promise of defining climatic extremes so that the Army could better write specifications for contractors who might furnish any sort of material for them.

It was in vogue then to say that this type of study was "clearly in the national interest." On the basis of this new project, Mr. Pales asked for three more GS-8 observers.

At a Washington, D.C. science meeting, Mr. Pales had referred to the observatory as the Mauna Loa High Altitude Observatory established on July 1, 1957.

The acting Chief, Meteorological Satellite Section, WB, wrote a four-page report to Dr. Wexler on May 16, after a visit to the observatory while Mr. Pales was away on his trip.

He said that there was confusion as to who was supposed to be giving direction to the group. He advocated expanding the building so as to have a more pleasant place for off duty hours. He thought that the "large number of partly finished installations at the observatory" was"indicative of too many tasks being undertaken by the limited staff."

The people there, he said, "were there to make a living and couldn't be expected to have the motivation of research scientists," and anyway, "the three-hour ride up the road was enough to shake out what little enthusiasm they might have had."

Dr. Wexler came again in June with$15,000 of the $100,000 asked by Kulani for the road work needed. Mr. Foss worked out the details which consisted of using the funds to buy Kulani three new trucks.

Dr. Wexler said that he was not all that impressed with continuing observations once they got started. He said that projects should be undertaken that could only be done at this unique site. He cautioned about accepting any programs from either within or without the WB which might destroy the uniqueness of the location.

He had the radiometer observations, which had not given data that anyone wanted to use, stopped and suggested a simple temporary wind observing network about the mountain.

He asked for a once-a-year report detailing the status of each program and what had been done with the data.

Mr. Foss was a legend with electronics and it was said that he could have had the top job in electronics in the WB, but had chosen the observatory instead because of his interest in solar energy. He was a man ahead of his time. He had all-around skills and worked out many details for the development of the observatory. However, at this time, he requested that he go on leave without pay at the end of the year to follow his own research interests.

Mr. Pales then changed his request for the new hire from three GS-8 observers to two temporary positions for the eighteen months and a permanent GS-ll physicist. He felt that the observatory was now in good shape and he wanted to return "home" to the mainland and the physicist was to take his place. Honolulu changed the two requested observers to two GS-7 physicists. They were hired in Honolulu and came over in November.

Early in January 1961, Dr. Wexler responded to Mr. Pales' lengthy year end report with a short note saying that the most interesting thing about it was the lack of mention of the simple wind observing network that he had suggested.

*** The End ***

APPENDIX:

Author's Notes

I was assigned in 1958 to the same WB laboratory in Washington, D.C. as the group studying atmospheric electricity at the Mauna Loa Observatory. Mr. Pales had also come from that laboratory. I was the physicist selected for the permanent position at the observatory in November 1960. I arrived in Hilo in January 1961 and remained with the observatory continuously for the next twenty years.

Mr. Vance was administrator of the Hilo Hospital from 1960 through 1965. He and the Hilo Lions Club were active in supporting the observatory from their strong political base during this period.

I was familiar with the files at the observatory and the Mauna Loa file of the Hilo airport WB station for the period through 1965. In 1975, I also read the files that OMR had kept concerning the observatory for the same period.