



HAWAII:
LOOKING BACK
FROM THE YEAR
2050

THE EDWARD BELLAMY
MEMORIAL LECTURES

KENT M. KEITH

Hawaii: Looking Back from the Year 2050

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By Kent M. Keith

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CONTENTS

Author's Preface (2020)	v
Author's Preface (1987)	vii
Lecture 1: The View from an Airship	1
Lecture 2: The Migration to the Sea	8
Lecture 3: War and Whales	20
Lecture 4: The Economy of 2050	32
Lecture 5: The Free Market Magna Carta	42
Lecture 6: Education and EduComp	50
Lecture 7: DDT, Vitamins and Greenies	59
Lecture 8: Daily Life and Times	69
Lecture 9: Looking Ahead to the Year 2100	81
About the Author (1987)	89
About the Author (2020)	91

AUTHOR'S PREFACE (2020)

Recently, when I was preparing a workshop for leaders at the City and County of Honolulu, I wanted to talk about human needs and our quality of life. I remembered that I had once written about measuring Hawaii's Gross State Quality of Life in addition to the Gross State Product. Then I remembered where I had made that suggestion. It was in a short book that I published in 1987 titled *Hawaii: Looking Back from the Year 2050*. This is that short book, republished word-for-word as it first appeared in 1987.

I wrote the book after serving from 1979 to 1986 in the State of Hawaii Department of Planning and Economic Development. I was the Ocean Resources Manager, then the Deputy Director working on energy and ocean issues, and finally the Director of the Department and a member of Governor Ariyoshi's cabinet. Those were wonderful years for me personally and professionally.

It was fun reading the book again in 2020, a full 33 years after I first wrote it. The book includes some of my favorite ideas, as well as a few fanciful notions (e.g. the lecture on war and whales). But reading the book after 33 years was also sobering. Back in 1987, I truly thought that by 2020 we would have made much more progress than we have in fact made.

However, I believe it is still worth considering many of the ideas and opportunities that are laid out in these pages. It is worth considering them as a way of stirring the imagination and brainstorming to find even better ideas. Governor Ariyoshi used to remind us that we should be working toward our *preferred* future. We can still do that.

Kent M. Keith

Honolulu
November 2020

AUTHOR'S PREFACE (1987)

The purpose of this volume is to stimulate thought about Hawaii's more distant future—not in 10 or 20 years, but in 65 or 75 years, several generations from now. Although many things which are described in this volume may indeed come to pass, the volume itself is not a prediction. It is simply a description of one possible future. It describes a future Hawaii in which I would be willing to live, but there are other futures which I could also imagine which would be equally satisfying and rewarding.

Imagining the future is fun. It is also essential. It is essential to think about different futures in order to choose some and avoid others—to define a preferred future and seek to reach it. Also, we may be able to discover ways of solving today's problems by looking at things from a new perspective—that of our grandchildren.

This volume began with a speech to the Hawaii Society of Corporate Planners on May 6, 1986. In expanding that speech into the present volume, I have chosen the lecture format because lectures for general audiences are designed to be informative without being overly academic or technical.

I have titled these lectures the “Edward Bellamy Memorial Lectures” because one of the first American writers to deal with social and economic futures was author and social critic Edward Bellamy, 1850-1898. His book, *Looking Backward 2000-1887*, has been deemed to be one of the most influential books of the late 19th and early 20th century in the United States. I would not be comfortable in the world he envisioned, but it is not hard to imagine that an institution might establish an annual lecture series in his memory.

I have been influenced by the works of many authors,

including Bellamy, Arthur C. Clarke, Isaac Asimov, Alvin Toffler, and the contributors to *Hawaii 2000*, the proceedings of the Governor's Conference on the Year 2000, which was held in 1970. I have freely borrowed and incorporated ideas from them all.

If it were really 2050, you would be listening to this on a speech speed enhancer or scanning it on the screen of your armstrap compu-phone; but until then, here is the hard copy. Have fun!

Kent M. Keith

Honolulu
October 1987

LECTURE 1:

THE VIEW FROM AN AIRSHIP

Good evening, distinguished guests, friends, ladies and gentlemen.

It is a great honor to have been chosen to deliver the Edward Bellamy Memorial Lectures of 2050. Mr. Bellamy's compassion for the human race and his sense of human possibility have been an inspiration to many people around the world for 160 years. His book, *Looking Backward*, written in 1887, described what he felt would be an ideal society in the year 2000. It had a great impact on the general public of his day, and was deemed to be one of the most important books written during the fifty-year period from 1885 to 1935.

I want to thank you all for the honor of your physical presence. I know that it would have been more convenient for you to meet by VideoCam, seated comfortably in your own homes and offices. But I am old fashioned, and I still like to see people in person, rather than on the screen or in holograms—especially when there is the opportunity for group discussion. So again, I thank you for the honor of your physical presence.

My task as the lecturer is to comment on issues and developments over the past 75 years, and their implications for the future. Even in nine lectures, it will be difficult to cover the many important issues and developments which deserve careful analysis. I can only touch on the bare outlines, and weave a few of the threads. I hope, however, that my comments will be sufficient to stimulate questions for the discussion period which will follow each lecture.

I think it would be appropriate to begin with an overview of our islands as they are today. I have just had such an overview—

literally— of many of our islands during my trip here today by air.

I certainly enjoyed my trip. I still think that the loveliest way to see our islands is from the gondola of an airship— or blimp, as they used to be called. At one hundred miles per hour, it would have been faster by plane, but the leisurely, smooth ride, with a clear view on all sides, is without comparison. I fall in love with Hawaii again every time I take such a trip, and I take one as often as I can.

Millions of people enjoy viewing Hawaii by airship, cruising with the tradewinds, flying low over our beautiful landscapes and seascapes, eating and drinking in the gondola lounge, or standing at bay windows taking photos and talking with flight guides, while the panorama unfolds below. Airships are quieter and safer than those noisy, shakey helicopters of yesteryear.

I boarded my airship, the S.S. *de Heer*, at a small landing field in Hamakua. The *de Heer* arrived this morning from the Davies Dillingham floating city, which is now mining manganese nodules about 600 miles southeast of the Big Island. The *de Heer*, incidentally, was the primary workhorse in the movement of major structures to the mining city when it was being assembled on the high seas.

As we headed down the Hamakua Coast, I could see the Onizuka Center for International Astronomy on Mauna Kea, now busy as the world's largest center for astronomical observations. Approaching Hilo, I could see the ponds and facilities of the extensive Matsuura Unagi Farm, where a new strain of eel, *Anguilla Matsuuri*, was developed by a former State Senator, and marketed successfully by his descendants. They now have a major share of the world market.

We then moved across the Hilo Culture Complex, which is not only an international culture center, but a special place for me. Since childhood, I have enjoyed Time Travel Town, or T3,

as it is widely known. Now that most people can travel anywhere in the world they want to, there has been a great increase in interest in the only places to which we can't travel directly— the past and the future. Time Travel Town certainly makes other periods of history and other cultures come to life, and allows millions of people to “try on” different futures as well. Putting on the costumes, living in buildings which represent the period and place in question, interacting with a well-educated guide posing as a person of that period— one really feels that one is living in a different time.

My favorite part of T3 is the Tokugawa Village, complete with castle and rice fields. Visitors interested in court life dress up in *kimono* and *hakama*, live for a day or two in palace quarters, attend tea ceremonies, moon-viewing, and martial arts training for the palace guard. Visitors interested in peasant life dress up in straw shoes and hats, work in the rice fields, prepare and eat authentic meals, and learn legends and ghost stories. Both the “courtiers” and the “peasants” attend festivals, visit the village shops, pay their respects to the Emperor and Shogun, and take introductory courses in calligraphy or archery or swordsmanship. Once I took the two-day special *Chushingura* tour, and got to be one of the famous 47 *ronin*.

At any moment, there may be *samurai* sword fights in the village streets, and visitors have to take cover. These fights, staged by full-time professionals, are quite convincing. As we sailed overhead this morning, it seemed to me that I could see the glint of the swords in the sun, and hear the gleeful voices of children, reacting just as I did, 40 years ago.

Another of my favorites is the New England Colonial City, a replica of an American city during the time of the American Revolution and Constitutional Convention. As a high school student, my class acted out the Constitutional Convention of 1787, each of us playing the part of a specific historical figure. I was Benjamin Franklin. We gave speeches, caucused,

negotiated, and voted the Constitution into its final draft. I learned more about our Constitution and national government during that week than I imagined possible. The Colonial food was moderately good; the candles were dangerous— I kept forgetting to keep them away from flammables; the buckle shoes, tri-corner hats, ruffled shirts, and spectacles became rather comfortable; but I never got used to the sanitation system.

As a college student I became more adventurous and tried another part of T3, Life on Titan. Titan is a moon of the planet Saturn which appears to have potential as a future exploration base for our expansion through the solar system. Titan is the only satellite in the solar system known to have its own atmosphere. The atmosphere on Titan is much less than Earth's, and it is mostly ammonia, so it is poisonous. Settlers in space suits could live there, however, in cities built under the planet's surface. Part way through the two-day simulation, I tore my space suit on a trip outside the city, and was declared dead of ammonia asphyxiation. They allowed me to continue, however, since I had paid the full fee for the whole experience, and there was more to learn.

In addition to T3, of course, there is the Pan-Pacific Intercultural Theater Arts Guild and the Transnational Symphonic Interpretation Society, with their marvelous, justly renowned performances of music and drama; the Merrie Monarch Festival, with its *halau's* competing in *awana* and *kahiko* styles; the *O-Bon Odori* Festival; and all the other outstanding cultural events which bring 2 million visitors per year to the Hilo area.

Rain was a major problem for Hilo in the last century. Now, thanks to that orbiting space mirror which evaporates much of the moisture in the sky above Hilo, it only rains half as much as it did 75 years ago. The rent paid to Weather Control for the use of the space mirror is one of the best investments the County of Hawaii has ever made.

Floating down the coast further, we passed the Puna Spa, located at our famous geothermal hot springs, which is visited by hundreds of thousands of visitors each year. Personally, I don't enjoy the sulfur smell, but hot springs of this kind are enjoyed by millions of health-seekers in several countries, most notably Japan.

Looking further south, I could see the Space Launching Center at Ka'u. The Center was busy this morning launching rockets with supplies for the moon. Lunar settlement first occurred only 20 years ago. Today, with 300 lunar settlers living at three stations on the moon, there is a lot of launching to do, and Hawaii is one of three national launch sites. This has meant good business for Hawaii.

Activities at Ka'u will pick up even more when the Hilton Orbiter Hotel opens its doors— or rather, its airtight compartments— for wealthy space visitors next year. The average visitor can orbit the Earth a dozen times a day, and has a choice of landing sites for return by Shuttle. This may be the ultimate vacation, but as the saying goes, “the cost is astronomical.”

Coming around South Point, we floated up the Kona Coast, almost to Keahole, where I could just barely see Ocean Science City. Ocean Science City began in 1974 with the establishment of the Natural Energy Laboratory of Hawaii, and doubled in size and potential with the establishment of the Hawaii Ocean Science and Technology Park next door in 1986. Historians will note that NELH was the original site of Hawaii's abalone and micro-algae industries. This is also where most of our early ocean thermal energy conversion (OTEC) research was carried out.

The Hawaii Ocean Experiment, begun by the University of Hawaii in 1986, led to the establishment of the Ocean Exploration Center, a complex of scientists and submersibles, underwater

research labs, and ocean floor visitor centers at Keahole. Many of the world's new technologies for ocean research and resource development have originated at this Center.

Glancing a little further up the coast, I caught a glimpse of the Ken Kiyabu Memorial Sports Center, and the Virginia Isbell Bicycle Path which is connected to it. The Kiyabu Sports Center has been a great success, especially with the international prominence of the annual Silicon Man Triathlon, which brings thousands of athletes to Hawaii for training and competition every year. The Isbell Path is used by more than 100,000 cycle enthusiasts every year.

Crossing the Alenuihaha Channel, we moved up through Kahoolawe, Maui, and Lanai. Kahoolawe has done exceptionally well with its aloe industry, and prospects for its goatmilk cheese are also good. The West Coast of Maui is now one long golf course, green and open, and known for its "greens" and "Opens." Maui is a major Pacific data center and clearinghouse for professional services. Lanai's resort complex has become the State's highest-priced, most exclusive hideaway for media stars, world leaders, and the generally wealthy. Some of them sign up for experience tours, and work a day or two in the pineapple fields while they are there.

Perhaps the most gratifying change, from the point of view of our ancestors in 1975, would be the present activity on Molokai. Seventy-five years ago, Molokai had the highest per capita unemployment in the State. Today, with tourism, agriculture, Hawaiian cultural living parks, and spiritual retreats, it is a quiet but economically productive place.

One million people per year visit our State for reflection, meditation, and the pursuit of a better understanding of the Divine. Ten percent of these people visit the Father Damien Spiritual Center at Kalaupapa for extended periods. It is now the most active spiritual center in the world. It can only be

approached by mule or semi-submersible, in silence and humility. The work of Father Damien in serving the lepers at Kalaupapa in the 19th century is now known throughout the world, as an example for people of all faiths.

Incidentally, I also enjoy flying over Molokai watermelon fields. It gives me pleasure to know that the square Molokai watermelon has repeatedly been awarded the *Grand Crus Classe* at the International Watermelon Tasting Competitions. I am particularly fond of the Pfeil Q-6 Hybrid, which has won so many awards in the last few years.

The East end of Molokai reminded me of Kauai, which was not visible on my trip. Kauai is still lush and green, due to the survival of sugar, biomass industries, and the development of exotic crops. This lush green backdrop has supported a strong visitor industry, with its highly rated aesthetic experience tours. The island is best known, however, for its media industry.

And so we approached Oahu, the gathering place, which remains our capital and our largest business center. Visitors still flock to Oahu beaches for sand and surf. But many also come for international business, for education, and for shopping, since Oahu is a fashion leader, and a major jewelry center.

As we rose above the Koolau mountains, I could see far across the central plains out into the ocean. There, on the horizon line, I could see Oahu's fleet of floating cities, the loveliest fleet of artificial islands anchored in any ocean. And that is where my airship gently alighted— on the world's largest ocean floating city.

LECTURE 2:

THE MIGRATION TO THE SEA

It is particularly appropriate to be presenting these lectures on board the *John P. Craven III*, the largest and most impressive of Hawaii's floating cities. Seventy-five years ago, back in the 1970's and 1980's, Dr. Craven carried out the first engineering and economic studies for floating cities in Hawaii. It is only fitting that three generations of floating cities have now been named for him.

It is a little-known fact that the first breakthrough in the introduction of ocean floating platform technology resulted from a severe political problem: the location of a convention center. Back in the 1980's, visitor industry officials sought the establishment of a convention center to compete better for conventioners, who spent more money per person than the average visitor. Unfortunately, every possible site on land had strong opponents or problems. The military would not give up Fort DeRussy; the City would not give up the Zoo; thousands of golfers would not allow the use of the Ala Wai Golf Course; and the State would not give up the piers or planned park space at Fort Armstrong.

That is how the Kelly-McMurdo Ocean Floating Convention Center became a reality. It was financed by Aloha State Bonds, and built in detachable modules. For nearly thirty years, it floated a few miles offshore Waikiki. Some of you here today may remember seeing it as a child. It was easily accessible by semi-submersible ferries, which could carry up to 1,000 people from their hotels to the ocean floating convention center in only ten minutes. Traffic was no problem, because the ocean is the world's broadest highway, and only three small piers were necessary for offloading on shore.

One of the unique marketing features of the Kelly-McMurdo Ocean Floating Convention Center was that it could be floated from island to island, so that conventioners could choose to have their convention offshore Waikiki, or Kona, or Lahaina, or Na Pali, or wherever they wished. This also satisfied the leaders of the Neighbor Islands, because they could have a convention center at least one or two months a year.

So that's how it began. We might still have only *one* floating platform—the Kelly-McMurdo Ocean Floating Convention Center—had it not been for the convergence of at least four factors. Those factors were the Great Tsunami of 1998; the Drivers Revolt of 2009; the rise in sea level which resulted from the greenhouse effect; and the convenience of life on an ocean floating city.

As for the Great Tsunami of 1998, it wrapped around Oahu and damaged the Waikiki and Honolulu shorelines. After the tsunami passed, it was noticed that the Kelly-McMurdo Ocean Floating Convention Center was virtually unaffected. A tsunami is a wave which rolls through the ocean, and wreaks no damage until it reaches shallow water and runs up on land. The Great Tsunami was not even noticed by the conventioners on the Kelly-McMurdo Ocean Floating Convention Center. The reason was simple: the waves passed through the pontoon hulls deep in the water beneath the floating platform, rather than smashing into the platform itself, which was perched high above the waves. This lesson was not lost on the owners of shoreside property which was destroyed by the tsunami. They began to seriously discuss plans for ocean floating hotels, homes, and office buildings.

The second factor stimulating our migration to the sea was traffic on land. Traffic was a severe problem. Traffic jams increased in the 1980's and 1990's, even with the addition of H-3 in 1998, carpooling, vanpooling, high occupancy vehicle lanes, staggered working hours, the establishment of

employment centers outside of Honolulu, ferries from Hawaii Kai and Ewa Beach, and an increase in the number of people working at home with computers and later VideoCam. Even with all these important efforts, at the time of the Drivers Revolt of 2009, commuting time was an average of two hours each way, or four hours per day.

As you know, on March 3, 2009, a particularly bad traffic situation developed as the result of several accidents on the main arteries leading into downtown Honolulu. One driver, Pat “Big Boy” Smith, who had been stalled in traffic for three hours, turned off his engine, got out of his car, and started walking into town, shouting, “I’ve had enough! I’m going to City Hall! I’m going to the Capitol! I want action! Enough is enough!”

As he walked, he continued shouting. One by one, other drivers turned off their engines, got out of their cars, and started following Big Boy Smith. Mile after mile they walked, attracting more and more followers as they went. By the time they reached the City Center, there were nearly 50,000 of them. Having turned the freeway into the world’s largest parking lot, they marched on the Capitol, where the legislature was in session. Legislators had to be evacuated under police escort.

The Governor appointed mediators, but the mob wouldn’t accept mediation. When news of the uprising spread on the news networks, more people went to the City Center to join in. The police were overpowered, and the government continued to operate from behind locked doors and barricades. This lasted for several days. During that time, the city came to a halt. There were 40,000 cars sitting in the middle of the major freeway arteries, and little could be done about it. The police began towing the cars from the open ends of the freeways, but there was no place to put all those cars, nor very many backstreets to move them through, so the effort was given up. The police then ticketed the cars, and this stimulated a new uprising, which I regret to say was marked with violence to property— police

cars. Crowds rolled the police cars over, and ran.

Eventually, the protestors and their families began to find life difficult without their cars and highways. Gradually, they returned to their cars and drove them home. It was several days before traffic was “normal” again.

Meanwhile, the Governor, Legislature, Mayor and City Council began taking action to alleviate traffic woes. After thorough research, the government decided to promote the introduction of hovercraft. No-interest loans for the purchase of hovercraft were made available, and the government ordered hovercraft in large quantities, passing along the low purchase price to the citizenry. New lanes along existing arteries were opened up specifically for use by hovercraft.

The hovercraft was the perfect new form of transportation. Also known as a Ground Effect Machine or Air Cushion Vehicle, the hovercraft was developed in the late 1950's and early 1960's. A hovercraft rides on air jets, which raise it a foot or two above the ground. It travels over any roughly level surface, and that surface can be sand, ice, snow, ploughed fields, lava, swamps, or calm water. Very large hovercraft can ride over ocean waves as high as three to five feet. In 1962 a British hovercraft began ferry service in the English channel.

The hovercraft has had many impacts which today we take for granted. Powered by hydrogen, they give off harmless exhaust, far superior to the smelly, stinky, nauseous discharges from the old gasoline automobiles. And not having wheels, they do not require smooth surfaces; potholes are not a problem, so highways do not have to be kept up. Since they have no wheels, there are not just four points of contact on the highway which bear all the vehicle's weight. The air jets cover a much larger surface area. Therefore, the highway itself doesn't have to be as strong. Again, this means it doesn't cost much to build a road for hovercraft. Actually, we don't need roads anymore, in the

20th century sense— an open plain is sufficient. It is interesting to note that roads built in 1975 are still usable today, long after they would have decayed beyond use by automobiles with wheels. We've saved several billion dollars in road repairs over the last 40 years due to this change in vehicles.

Soon after the Drivers Revolt, hovercraft were used on highway shoulders, old cane roads, and designated open fields, to immediately alleviate congestion on the automobile highways. With the approval of federal authorities, hovercraft were allowed to cross the calm water of Pearl Harbor during restricted periods, to improve traffic from Ewa to Honolulu and back.

Gradually, the advantages of hovercraft became so obvious, that there was a wholesale conversion to their use. The biggest benefit, far above and beyond the improvement in transportation, has been the dramatic decrease in traffic deaths. Radar and danger sensors became standard features on all hovercraft, followed by reversed airjets which are triggered by an automatic pilot when a hovercraft is approaching another vehicle or object so quickly that a collision appears likely, based on calculated trajectories. These improvements have reduced traffic deaths by 80 percent, compared with the slaughter on our highways 75 years ago.

As you know, the most recent safety proposal is to require that every hovercraft be manufactured with “ramps” on all sides, so that a speeding hovercraft will ride up over, rather than collide with, a slower hovercraft. The hovercraft manufacturers are protesting that the radar, danger sensors, and automatic pilot reverse airjets currently in use are sufficient, and further change will cause the re-design of all their hovercraft models— at great cost to the consumer. The government is arguing that if this additional step is taken, traffic deaths will be nearly eliminated.

The other traffic solution, of course, was to move more of our people out on the water on floating cities, so that they could use

the ocean as a highway, and approach the downtown district from the ocean side as well as the land side. Government agencies promoted the migration to the sea by sharing in the financing of floating cities, and subsidizing the construction and operation of semi-submersible ferries. Semi-submersibles are well designed for this purpose. Soon they were running regular schedules, departing to and from shore every quarter of an hour, carrying up to 1,000 people at a time.

The third factor stimulating our migration to the sea was the greenhouse effect. The carbon dioxide from fossil fuel combustion traps heat within the atmosphere, preventing it from radiating back into space. This carbon dioxide can stay in the atmosphere for hundreds of years, with cumulative effects. It is estimated that between 1800 and 1980, total atmospheric carbon increased by 20 percent. With increased use of fossil fuels, the rate accelerated. There was an increase of eight percent between 1958 and 1985.

Thus, seventy-five years ago, the problem was clear. If the greenhouse effect continued to worsen, temperatures on Earth would rise, and the ice caps would melt. This would add to the amount of water in the ocean. It would also increase the volume of the world's oceans, since water expands in volume as its temperature rises. This could result in the flooding of the world's coastal cities, which would sink below the waves like the fabled Atlantis. Seventy-five years ago, it was estimated that the ocean level had already risen about six inches due to the greenhouse effect.

It was advisable, therefore, to drastically reduce the use of fossil fuels for energy generation. The first push was toward nuclear fission. After the Three Mile Island incident in the United States in 1979 and the disaster at Chernobyl in the Soviet Union in 1986, it was clear that the risks of nuclear fission were too high.

This rejection of nuclear fission focused world attention on nuclear fusion, and a more rapid shift to renewable energy sources, a movement in which Hawaii exercised substantial world leadership at the end of the last century. In spite of efforts to reduce oil and coal consumption, however, by the year 2015 the sea level had risen one foot. The trend was ominous. Public and private planners were faced with major shoreline stabilization projects to protect Waikiki, Honolulu Harbor, and other coastal areas. These projects became so expensive that it was decided to move more and more coastal facilities out on to the sea instead.

In Waikiki, the most densely populated 400 acres in the United States in the late 20th century, hoteliers began moving to floating cities. As the old hotels were torn down, the land was purchased by the government and restored for park use. This was often referred to as the “Hilo Plan,” harking back to the tsunamis of 1946 and 1960 which leveled Hilo. As you know, the area of major destruction in Hilo was never rebuilt, but was kept open and dedicated for park use.

Thus, one benefit of the migration to the sea is that our lowlands now look much different than they did 75 years ago. Gradually, more and more of our shoreline areas have been restored to open space, consisting of beaches, parks and picnic areas covered with grass and palm trees. Almost all land on the *makai* or ocean side of the old coastal automobile highways is now clear of structures. This is something we take for granted, today. It is hard to believe those old pictures of 50 years ago, which show so many hotels right on the shoreline. No wonder public beach access was such an important political issue.

As we now know, the total rise in sea level over the last 75 years has been a foot and a half. The rate of increase has slowed, apparently to a standstill, but we are not sure. In any event, we are sure that the migration to the sea was the best option for coastal uses.

The fourth factor contributing to our migration to the sea was the convenience of living on the ocean. The crowding, traffic jams, and limited housing available on land were discouraging. With population increasing; with houses and apartments becoming smaller; with land prices continuing to rise, it was necessary to create new land— on water. But there was more to it than that. Floating cities solved many urban problems.

Ocean floating platforms are as old as the raft, the barge, and the houseboat. In the 20th century, the technology was developed by major oil companies, which erected more than 2,300 offshore platforms in the Gulf of Mexico between 1940 and 1975. At first, the platforms were oil rigs like “Texas Towers,” with legs fixed to the ocean floor. Then came jack-up rigs and monopods, which could float and be towed to their drilling sites, where they would set down their legs and raise their platforms out of the water.

Finally, the technology evolved to free-floating, dynamically positioned platforms. Free-floating platforms do not have legs or anchors, but rather huge submerged pontoon hulls, which hold the platform high above the water. Propellers and ballast adjustments kept these platforms in position by countering the effects of wind and waves.

People wouldn’t want to live on a platform which rolled and pitched like a ship, so a lot of attention was given to achieving stability. There is a band of disturbance 40 feet above and below the ocean surface where wind energy and ocean currents meet. So engineers designed platforms which were semi-submersible, with hulls floating below the band of disturbance and platforms resting above the band of disturbance. The result was complete stability. That meant that anything done on land could be done on the ocean.

Floating cities gave planners and architects the opportunity to design the “cluster neighborhoods” they had advocated on

land. Each floating city is a separate community, tied into the larger community by transportation and communication networks. A maximum number of activities and services occur within the floating city itself.

A typical floating city today is two miles square and 200 feet high. It supports a population of between 10,000 and 25,000 people. High-density activities, such as concert halls, schools, and sports arenas, are concentrated in the center of the city. Moving out from the center, there are medium-density offices, department stores, restaurants, and hospitals. Low-density homes and parks are at the periphery or outside the ring. This is the old “beehive” concept: an individual traveling toward the center of the city encounters progressively higher densities.

Densities as low as 15 people per acre have been achieved at the outside ring, with approximately 10,000 square feet of space for a family of four. One advantage is that one can walk between any two points in a floating city in about 30 minutes. Walks of only ten or 15 minutes are required for shopping, work, or entertainment. All of this has saved on transportation costs within the city. Transportation to land, on semi-submersible ferries, is also inexpensive.

Our floating cities are rather self-sufficient. Each one is powered by OTEC, each has a desalination plant for water, each grows a portion of its food on its rooftops, each harvests fish, and each has a vibrant business and political community. They are extremely pleasant places to live. There is much literature from the past thousand years about the beauty of the sea, looking out from land; I am also enchanted with the view of the land, as seen from the sea.

The hotel industry has benefitted. Ocean floating hotels offer both an ocean and a mountain view, and quick access by water to and from the airport. The floating breakwater enclosures inside the floating hotels allow visitors to go boating, fishing, or

skiing on flat water, or sun themselves on sand barges floating at the edge of the breakwater.

Floating cities have also caused an explosive expansion of our fishing industry. Like the tiny Fish Aggregation Devices which the State government placed in the ocean around Hawaii in the 1980's, floating cities attract fish. They provide habitats for small fish, which attract larger fish, which attract larger fish. The use of fish attractants, nets, and traps has been most effective, with the result that most floating cities are self-sufficient in protein, and are fish exporters. Floating cities also have the best *sushi* bars: the fish are drawn up live, directly from tanks suspended below the ocean surface, and sliced and served within minutes.

Of course, our migration to the sea has had its problems. At first, there was some criticism of the appearance of floating cities from the shore. Nobody wanted ugly "oil rigs" sitting just outside the reef. This was resolved by requiring floating cities to stay several miles from shore, and by adopting skyline shapes which resembled islands. The most popular design is generally known as the "Chinaman's Hat" design.

Other problems related to environmental impacts during construction, the selection of appropriate sites for floating cities, the routing of traffic on the ocean, the reapportionment of political districts, and the relocation of many businesses. All of these problems have, fortunately, been worked out to an acceptable degree.

And so, with the Great Tsunami of 1998, the Drivers Revolt of 2009, the greenhouse effect, and the convenience of life on floating cities, we migrated to the sea. Today, we have 30 floating cities, supporting half of our hotels, and nearly one fourth of our current population of 2 million citizens.

This migration to the sea has been, in retrospect, a great

benefit to our society. We have alleviated our transportation problems, increased our parkland and beachfront, preserved our land for agriculture and open space, enhanced the efficiency of our daily lives, and done much to rebuild a sense of community. Floating cities have revolutionized city planning, and improved our quality of life.

Further migration to the sea seems sensible. Not all offshore waters are suitable for floating platforms, but our 200-mile Exclusive Economic Zone is 100 times larger than our land mass, so the potential for further use is large. The ocean offers us food, water, energy, transportation, recreation, and living space. We have just begun to appreciate how to protect, conserve, develop and manage this extraordinary resource.

Our migration to the sea has given us one more thing. We have, to some extent, regained our lost heritage. We have regained the ocean as part of our culture, our psyche, our self-definition, our way of life in the Pacific.

The ancient Hawaiians could read the wind and the waves, the clouds and the currents. The ocean was an integral part of their daily life. The ocean was an extension of the land, and the land was an extension of the ocean. The ocean was a place to work and play, to use and enjoy. Life on other Pacific islands also included this balance between the land and the sea— a single continuum of the world's resources and mysteries. Human societies in the Pacific were amphibious. The ocean was part of the human consciousness.

When westernization came to Hawaii, Hawaii became land-oriented. As a result, during the 20th century half of God's creation was largely unknown to the people of Hawaii. They had lost the wonder and adventure of discovering, learning about, and interacting with the plants and animals and forces of the ocean world. Half of their potential experience as human beings was left unexperienced. They were not aware of the rhythms

and cycles of the planet. They were strangers in their own home.

With our migration to the sea at the beginning of the 21st century, we began to regain our lost ocean heritage. We began to rediscover what the ancients knew— the fullness of a life in which the ocean is part of our consciousness. This rediscovery has made our culture and our economy richer, but more important, it has made us whole.

LECTURE 3:

WAR AND WHALES

Ladies and gentlemen, in this lecture we travel back to the dark days of war and fear, the days of nuclear insanity in the late 20th century.

It is hard to imagine that in the late 20th century, the entire world lived under the threat of total annihilation by nuclear war. By 1985, for example, there were 50,000 nuclear warheads in the world's arsenals, ready for deployment. The danger from these warheads was not just the horrifying damage of the blast where each bomb would explode, but even worse, the effects of radiation and the "nuclear winter" which would follow a nuclear war and result in the degeneration of the environment and the death of all living things.

Thus, at the turn of the century, a series of misperceptions or miscalculations or the escalation of conventional wars could have led to the use of nuclear weapons and the end of all human life for all eternity. Even malfunctioning equipment posed a danger. Every few years there were false alarms, with bombers scrambling into the sky and preparing to launch their missiles, only to be called back at the last moment, when the computer error was discovered.

To make matters worse, the number of nuclear nations, and the number of madmen, continued to increase. The danger was made painfully vivid by the nuclear exchange between Iran and Iraq in 1995. Using nuclear missiles supplied to each of them by Libya's Colonel Khadafy, Iran and Iraq brought the world to the brink of a general holocaust. Fortunately, restraint by the superpowers kept the battle limited, so that the nuclear exchange went no further than Iran and Iraq. Unfortunately, the

genetic damage from the nuclear fallout of that brief missile exchange is still with us. However, it did shock the world, and it did lead to a plan for nuclear disarmament.

The plan was an international agreement which provided for the staged dis-assembly of nuclear weapons, with complete verification of their condition by physical inspection on the ground and photographic inspection from the air. Today, I am happy to say, it would take at least two months to re-assemble the plants which manufacture the parts which go into the armaments which could blow us up. This has greatly reduced the possibility of an accidental worldwide nuclear holocaust.

The suffering from the limited nuclear war between Iraq and Iran also gave rise to a new approach to addressing the causes of war. The U.S. immediately expanded the Peace Corps. Next, the U.S. significantly increased the construction activities of the Army Corps of Engineers and the Seabees, which have by now built thousands of dams, bridges, roads, schools and hospitals in developing countries around the world. The U.S. also founded the U.S. Mediation Service, and expanded the faculty and facilities of the Matsunaga Peace Academy.

This did much to solve a moral quandary for many of the people of Hawaii. The people of Hawaii believed in peace. They knew that a reduction in armies and weaponry all over the world would be an important moral and economic victory, since it would enhance peace, and divert badly needed funds from military to health, education, and welfare programs.

However, the military was a major industry in Hawaii 75 years ago. A reduction in armies and weaponry all over the world would have been a grave economic loss to Hawaii. The people of Hawaii wanted peace, but they also wanted jobs—and in those days, the military was about one sixth of the Gross State Product, including 60,000 uniformed military jobs and 20,000 direct civilian jobs. If the military and its activities were

to be greatly reduced, the unemployment rate in those days would have risen from five percent to 10 or 15 percent.

The solution for the world, and for Hawaii's economy, was to broaden the definition of "peace-keeping" to include both the fighting of war, and the prevention of war by the reduction or elimination of its root causes. Military funds shifted toward a more comprehensive program of foreign aid by teaching and doing, helping countries solve the fundamental problems of starvation, education, and economic chaos which give rise to political instability, regional rivalry, and megalomaniac rulers.

Thus, over the decades, the total number of men and women in uniform has not declined greatly, nor have the budgets. But more men and women in uniform are building schools and hospitals; more of them are advising on crop yields and factory productivity; more of them are teaching languages, and training people in the use of technology. More people are integrating the arts of war with the arts of diplomacy.

Now, with conventional warriors and weapons as back-up, we spend more time and money building and teaching and healing, to make war less likely. With hundreds of thousands of men and women undertaking the fundamental tasks which affect the quality of life of all the people of our planet, peace does not seem like the impossible dream it was for our forebears. With the headquarters of the U.S. Mediation Service here in Hawaii, we are at the center of many of our nation's efforts to establish more permanent grounds for peace.

There are at least three factors or events which have helped the world toward peace during the last fifty years. The first was the vast increase in communications between individuals around the world. Beginning with access to peace satellites, more and more scholars, businessmen, and other interested citizens took to the airwaves to share information with others in distant lands.

At first, dictatorships and communist governments attempted to stop it, but as communications equipment became smaller, cheaper, and more available, the trend became unstoppable. People around the world were talking and sharing information like never before. Government propaganda and news censorship continued, but they were no longer effective. Meanwhile, international networks of individuals with similar interests began to form and grow. Non-political, non-ideological relationships flowered. More and more of the world's citizens had friends and colleagues in those countries which their governments treated as enemies. More and more of the world's citizens had information which would cause them to reject the warlike posturings of their governments. A new basis for international cooperation and peace was being laid, person to person.

This led to a strong movement in support of the establishment of a world government, as the best way to enhance cooperation and manage conflicts between nations and cultures. As early as 2005, a small group of 14 nations formed a pact for joint defense and turned their military establishments over to a joint command. This was followed by increased economic cooperation between the member nations. The pact has now been signed by 43 nations, including most of the members of the North Atlantic Treaty Organization and the former Southeast Asia Treaty Organization, plus Sweden, Spain, Japan, Taiwan, and India. The group is known as the "Federated United Nations," the largest power bloc within the United Nations. Superpowers such as the United States, the Soviet Union, and the People's Republic of China have not joined.

A second factor which has helped world peace was economic improvement in the developing countries. Personally, I am very proud of the World Productivity Campaign of 2015-2025, and Hawaii's role as a training center in that Campaign. Few decades in the history of the world have ever been as humane and beneficial as the ten years from 2015 to 2025.

The World Productivity Campaign grew out of three trends of thought—moral, economic, and political. First, there was genuine moral concern. It became more and more troubling to the people of advanced nations to watch millions of people starve to death in less developed countries, while grain rotted in warehouses or bags of dried food sat on shelves in the advanced countries. There were economic and logistical reasons for this, but on a moral plane, it was hard to accept. In all cultures and religions since the beginning of human society, it has been considered right to feed the starving and shelter the homeless. Some argued that there was no moral duty to feed or shelter one's enemies. By the turn of the 20th century, however, it was felt that the people who were starving were not our enemies— they were just people. And it was hard to justify our luxury in the face of their starvation.

Those taking this moral position agreed that just distributing food would not solve the problem. As the proverb has it, if you want to feed the poor, don't give them a fish— teach them *how* to fish. For moral reasons, something had to be done to assist long-term economic growth, and help the less developed countries “catch their own fish.”

The second reason for the World Productivity Campaign was economic self-interest. The advanced nations had discovered by the turn of the century that they could not grow much further economically without larger markets; and they would not have larger markets unless the economies of what they called the “developing countries” grew significantly.

The old “colonial” relationships had ceased to work. The advanced nations could not just buy raw materials from the less developed countries, and then sell finished goods back to them. The finished goods were too specialized and advanced for the developing economies. Advanced economies were thus trading more and more with other advanced economies. But the markets in the advanced economies were limited. Growth in

the advanced economies thus depended on the less developed economies becoming advanced as well.

The third reason for the World Productivity Campaign was political. Political instability in less developed nations was a problem. Many people felt the instability was due to lack of education, low economic productivity, poor management practices, insufficient infrastructure, and inadequate training. Countries with poor economies were likely to have totalitarian governments, which were likely to try to rally their own citizens' loyalty by creating an atmosphere of conflict with other nations. Border skirmishes, terrorism, and the threat of nuclear war kept local citizen loyalty high— but it kept the possibility of global nuclear war equally high. Thus, it was generally felt that economic improvement would be good for everybody, both the advanced economies and those less advanced.

The World Productivity Campaign was launched under the auspices of the United Nations in 2015 after five years of planning. Each recipient country specified what assistance it wanted or did not want. It was clear that this was not charity, since the future economic success of the advanced nations depended on the success of the developing nations. A basic premise was that the Campaign was in the best self-interest of the giving as well as the recipient nations.

The lead nations in the effort were the United States, Japan, the Soviet Union, and the European Federated States, all of which invested heavily in the infrastructure, training, and productivity of the less-developed economies of the world. This slowed the advanced economies for a number of years, but by the end of the Campaign, the entire world economy was on the upswing. With a few aberrations since then, the upward climb has continued.

Not least among the benefits of the Campaign is the fact that now, virtually everybody alive on this planet has enough

food to eat and clothes to wear. Luxury is not widespread, but everybody has enough to survive. This brought human reality into line with human ethics, perhaps for the first time in the industrial era.

Another important benefit of the Campaign was a lower birth rate, and lower population growth. By the turn of the century, economically advanced nations had already reached zero population growth, and several had begun a population decline. With the economic growth and higher standard of living stimulated by the Campaign, this same trend reached many developing nations.

A third factor in world peace has been our surveillance systems. While we are now at peace, the enforcement of the peace is a major, and difficult, issue. Two military surveillance systems have been of inestimable value.

First of all, there has been a vast increase in the number of satellites, and later space stations, circling the globe. In addition, we have increased the clarity of our photos of the Earth's surface. We can now distinguish objects that are one square foot in size—a degree of resolution which makes it very hard to hide what is happening on land.

In addition to the satellite surveillance from the sky, peace has been promoted by a very effective international and neutral peace-keeping force in the ocean. It is a curious story, one which has been the subject of many books and movies in virtually all languages and localities of the globe.

It all began seventy-five years ago at the Marine Mammal Laboratory in Honolulu, where scientists studied the behavior and language of dolphins and whales. It was known that dolphins and whales were quite intelligent—dolphins have a brain-to-body ratio which is close to that of human beings, and while the ratio is not so high for whales, the absolute size of the

whale brain is the largest among mammals. It was also known that dolphins can produce an enormous variety of sounds, up to frequencies ten times those which can be heard by human beings. In addition to clicking and rapid creaking sounds used for echolocation, each dolphin has a “signature whistle” by which it identifies itself and is recognized by others. Dolphins were known to communicate and relay instructions to each other. Whales were known for their long, beautiful songs, which were thought to influence and direct the social systems of their species. Recordings were made of these sounds, which were eerie and enchanting.

For reasons unexplained at the time, in the year 2012 a new generation of marine mammal scientists decided to move their work out on the ocean. They received funding from a non-profit organization called Blue Peace, and launched a large ocean floating platform, which they named *The Lou Herman*. They slowly sailed *The Lou Herman* into international waters around Hawaii, and continued their research. Fishermen in the area noted a gradual but striking increase in the number of dolphins and whales in the vicinity of *The Lou Herman*; incoming freighters and naval vessels began to record large herds of humpback whales on their sonar. The scientists admitted this; they said they were feeding and caring for the humpbacks, and were delighted at the annual increase in their numbers.

In 2019, a food service operator who was fired and left *The Lou Herman* claimed that the scientists had learned how to speak to the dolphins and whales. It was said that dolphins and whales came into the chambers beneath the floating platform, were fed, “talked” with the scientists as though reporting on something, and then swam into the ocean again. It was also rumored that certain dolphins and whales had transponders planted in their backs, identifying them specifically by code name. They were tracked around the Pacific by satellite, it was said, but only the scientists could unscramble the signals, so nobody else could listen. It was further rumored that each pod

of whales was led by a whale who served as “talking chief” for the pod. The scientists named these whale leaders after 19th century figures such as Gladstone, Disraeli, Bismarck, Webster, Clay, Lincoln, Tokugawa, and Meiji. The prefix “Wh.” was used before the given name.

In 2023 a foreign trawler, a pirate on the high seas, attacked a whale off the coast of Alaska. The humpback was wounded, and emitted a chilling cry as it dove beneath the waves. Within ten minutes, the trawler was radioed by the Coast Guard that it was under arrest, and that there were Coast Guard airplanes in the air and a cutter at sea headed its way. It was told to cease and desist, and to remain where it was until the cutter arrived. Instead, the vessel turned to run. An hour later, it disappeared from the satellite scanner. The tape of the scan showed what appeared to be a herd of whales, ramming the vessel. This was deemed totally unlikely, and was not reported. The airplanes and cutter returned home.

A few years later, a passenger vessel caught fire at sea, and all passengers took to the lifeboats. Due to storm conditions, several lifeboats capsized. The satellite scan showed people struggling in the water, calling for help. Shortly thereafter, a large number of dolphins and whales appeared, moved gently in among the passengers, and helped them into the remaining lifeboats. The dolphins and whales kept clicking and singing, as though relaying instructions and reporting on the situation. They stayed until the nearest ship was re-routed to the rescue; then, as if on cue, the dolphins and whales all disappeared.

The mystery deepened when it was reported that scientists from *The Lou Herman* were meeting in New York with the United Nations; in Washington, D.C. with key Administration and Congressional leaders; in Moscow with the Politburo; and in Tokyo with the Prime Minister and leaders of the Diet. Finally, in 2031, they were ready. At a press conference in August of that year, they revealed the true purpose of their activities, and made

their demands.

They explained that in the late 1980's and early 1990's, scientists at the Marine Mammal Laboratory had developed special languages for communicating with dolphins. These languages made it possible for the scientists to provide information and instructions to dolphins, as well as to ask them questions. The dolphins, in turn, were able to use the languages to provide the requested information, answer the questions, and make requests of the scientists. As this inter-species communication was perfected, specially tutored dolphins were moved from the laboratory to the open ocean, where they assisted scientists in their marine research. These trained dolphins reported to the scientists on the objects and events they encountered in the underwater world.

To the amazement of the scientists, untrained dolphins from the open ocean began appearing and assisting the trained dolphins with their tasks. Still later, whales began to appear with the trained dolphins. The scientists discovered that the trained dolphins were recruiting other dolphins and whales, and were acting as interpreters between the scientists and the untrained animals. It was then, in 2012, that the scientists launched *The Lou Herman* in order to establish an ongoing community of interacting scientists, dolphins, and whales in the open ocean.

The scientists proceeded to attract large numbers of whales and dolphins to *The Lou Herman*, feeding them and talking to them. They had indeed given many dolphins and whales personal names, and implanted transponders for tracking. What was much more astonishing, they had implanted communications devices which allowed the trained dolphins to communicate and interpret for other dolphins and whales at great distances— virtually thousands of miles. A whale or dolphin in trouble, or a whale or dolphin spotting humans in trouble, could thus call *The Lou Herman* and other whales and dolphins. They had, indeed, sunk that trawler, and a number of

other pirate vessels which had attacked whales. And they had saved many people from drowning.

More important, the dolphins and whales had been tracking the movements of all vessels, including all military vessels, especially submarines. They made regular reports to *The Lou Herman*, where vessel movements were recorded. A special pod of whales carrying electronic detector equipment had systematically scoured the ocean, including the ocean floor, to find intelligence devices planted there by the superpowers. These, too, were recorded at *The Lou Herman*.

This was the information that the scientists had shared, in part, with world leaders. They revealed only enough to give their claims credibility. Each superpower knew that the scientists had top secret information which the superpower did not want divulged to its enemies. This brought all the superpowers to the table to sign the Honolulu Humpback Treaty of 2031.

The terms of the treaty were simple. The whales agreed, through their talking chiefs, to provide aid to human beings in peril on the sea, and to provide information on ocean conditions such as storms or tsunamis which might hurt human being on land or sea. Furthermore, they agreed to systematically map the ocean floor, by carrying sonar scanning devices back and forth through established matrices, recorded by *The Lou Herman*.

In return, it was agreed by the superpowers that whales and dolphins would be left alone. The intentional killing of a whale or dolphin by any human being would be punishable in human courts of law as murder. Furthermore, any vessel which attacked a whale or dolphin would be arrested, and if it refused arrest, the vessel would be destroyed. If no action were taken by human beings to punish the offender, the whales would settle the account themselves. If these terms were broken, the scientists, on behalf of the whales, would divulge all information about the submarine movements and the location of intelligence

devices on the ocean floor.

In addition, it was agreed that if the movement of military vessels or devices appeared to be warlike, or preparatory to war, the scientists on *The Lou Herman* would immediately divulge all such actions to all nations. Finally, it was agreed by all parties that *The Lou Herman* would be henceforth an independent nation, with full diplomatic recognition for its own government and sovereignty over its own property, so long as it remained on the high seas in international waters. Failure to respect the independence of *The Lou Herman* would result in disclosure by the scientists of the top secret information of the offending nation.

And so, whales and dolphins have grown in numbers, and now freely covort throughout the ocean, singing and splashing, talking and watching, without fear of harm. These intelligent species have taught us peace, and have helped make peace possible. With satellites tracking every movement and object on land, and a network of whales tracking every movement and device at sea, it became harder to prepare for war, and nearly impossible to attack, without everybody knowing in advance. The energies of war have now largely been diverted to the competition of ideas— a vigorous and important battle, but one which does not endanger the survival of the planet.

LECTURE 4:

THE ECONOMY OF 2050

In this lecture I would like to compare the economy of our State today with our economy in the late 20th century. I will discuss our Gross State Product, and our Gross State Quality of Life.

The year 1985 may serve as a point of comparison. In 1985, tourism accounted for about one third of our Gross State Product, the military was about one sixth, and agriculture was about one twelfth.

Today, the “experience industries” account for about 50 percent of our economy. These industries include tourism, entertainment, and education. Energy, including renewable energy and liquid fuels production, is about eight percent. The military is now part of the peace establishment, which accounts for about seven percent of our economy. Research and technology industries, including biotechnology and ocean technology, are about six percent. The media industry is about four percent. Marine mineral mining is about three percent; agriculture is about three percent; space launching is two percent; aquaculture is about two percent; and the fashion industry, including jewelry, is about one percent. These industries total 86 percent of the Gross State Product. Most of our business is international, and is conducted by small firms.

The rise in “experience industries” was predicted eighty years ago by an author named Alvin Toffler in a book titled *Future Shock*. As the world economy has done better and better in meeting human physical needs, more and more people have sought to satisfy psychological needs. The adventure and stimulation offered by new experiences is now

the largest single sector in the nation's service industry.

The “experience menu” offered at hotels and resorts is now a major competitive factor. It is true that many of our visitors are quite happy lying on the beach, sipping cocktails, listening to music, and watching each other. Many of them are also happy shopping for unique gifts and artifacts, and eating at exotic restaurants. Many of them come for sports— surfing, tennis, sailing, swimming, and golfing. But over the last 75 years, more and more people have come to learn and feel new things, and to grow in their understanding of themselves and the world around them.

There have been three trends— cultural, aesthetic, and functional. People want to learn about other cultures, in order to expand their understanding of the world. They want to learn how other people think and behave, in order to find new ways of thinking and behaving themselves. In this area, Hawaii has had a special advantage— we have been a multi-cultural community for nearly two centuries. A variety of cultures are still practiced, and the sharing of these cultures has been authentic. We are probably the world leader in the sharing of cultural experience. Cultural training and experience is offered at all the major hotels and resorts. Time Travel Town and the Hawaiian living cultural parks are among the best-known opportunities.

Aesthetic experience is probably the oldest part of the visitor industry. While it is more difficult to define, it has related strongly to the natural environment— the sand and surf, blue sky and palm trees, lush tropical valleys and steep cliffs, violent volcanos and serene mountain tops. These aesthetic experiences include the exploration of nearshore waters to appreciate sea turtles, fish, and whales in their natural habitats, as well as hiking into valleys and up mountain slopes to observe native plants and wildlife.

The aesthetic experience trend has expanded into pre-

programmed, custom-made experiences based on the favorite food, drink, music, art, and intellectual interest of each visitor. Having supplied the organizer of the experience tour with personal information on preferences, the visitor is led through several days of experiences by guides who have programmed the visitor's time for maximum enjoyment. Best known are the "Shangri-La," "Perfect Life," and "Heavensweet" tours.

The trend in aesthetic experience also includes spiritual experience. We in Hawaii have nearly 100 different religious denominations, and hundreds of churches, temples, and shrines. While the Father Damien Spiritual Center is the best known, there are many smaller retreats and religious centers which are active in helping their visitors reflect, meditate, and pursue a better understanding of the Divine. Most of these retreats are quite Spartan, and some involve pastoral labor, chanting, and praying in the style of Medieval monasteries.

The third trend in the experience industry has been functional— the learning of skills. The visitor learns how to paint, or carve wood, or write poetry, or surf, or speak a foreign language. Special tutorials are also available on a variety of "academic" subjects, such as interpreting literature, appreciating art, or understanding religion. What is common with all these trends— cultural, aesthetic, and functional— is that the visitor wants to grow, and return home enriched as a person.

Related to our visitor industry is our mental and physical health industry. People come to Hawaii for hospital treatment of long-term illnesses; for physical rehabilitation, due to accidents; and for rehabilitation from substance abuse. People also come to Hawaii for humane treatment when they are terminally ill. This industry, like our visitor industry, draws upon the Aloha Spirit in its sharing of love with those who most need help. I think it is wonderful that Hawaii is known today as "the Healing Islands," and I think it is wonderful that our healing addresses the whole person— both spiritual and physical.

Seventy-five years ago, the State began to vigorously promote the establishment of a renewable energy industry, and the effort has paid off handsomely. Hawaii was electrical energy self-sufficient by the year 2005. The major sources of electricity today, in order of importance, are OTEC, geothermal, biomass, wind, photovoltaic and hydro. The biggest renewable energy electric power plants are on the Big Island. They transmit most of their power to Oahu by way of a deepwater electric cable, one of the largest engineering and financial challenges of the late 20th century.

One of the problems of the late 20th century was the frequency of electric power blackouts. Our electricity was generated at just a few large power plants, which distributed power to large areas of each island. When a storm or technical failure affected those power plants or their distribution lines, total blackouts occurred over large geographic areas, shutting down most business, government and community activities at great economic cost and personal inconvenience.

This cannot happen today. We now have thousands of small photovoltaic, fuel cell, co-generation, methane gas, and other electrical power units in use at residences, commercial buildings, hotels, and industrial parks throughout the State. Photovoltaics and fuel cells in particular have greatly decentralized electric power generation.

While electrical energy self-sufficiency was achieved by 2005, liquid fuels posed a bigger problem. Research and development efforts finally settled on hydrogen. With major advances in the manufacture and handling of hydrogen, we achieved liquid fuel self-sufficiency by the year 2020. With renewables for electricity and hydrogen for liquid fuel, we have come a long way, indeed.

As you know, the world is now on the verge of the next great breakthrough, nuclear fusion. This is believed to be the ultimate

fuel. Fusion involves the conversion of hydrogen into helium, the process used by the sun to generate energy. It is universally agreed that fusion will be far superior to that old, deathly nuclear fission process, with its radioactive waste disposal problems.

I might say, in passing, that to our generation, it is very difficult to imagine that our predecessors burned oil. The Earth is flooded with energy from the sun, which can be converted to meet every need and purpose. And yet our forefathers burned a limited, precious, finite resource as though there were no tomorrow. The sheer wastefulness, for decades, on a global scale— well, it is hard to fathom. I can only affirm, sadly, that it happened.

In the early 1980's, as much as ten percent of the Gross State Product was leaving the State to pay for imported oil. Energy self-sufficiency has been a major achievement, with major favorable economic impacts. Today, instead of sending money out of Hawaii, it stays here. It multiplies in our own economy, where it is used to hire our own people, pay our own taxes, and provide our own public services. Now, we are a net energy exporter of hydrogen and ammonia.

Research industries have grown remarkably in Hawaii over the past 75 years, as they have in all advanced economies. Our special advantages in ocean research, biological and botanical research, agricultural research, energy research, cross-cultural behavioral research, market research, and other fields have made us a favorite place for professionals from around the world to live and carry out their work. With the advent of communications satellites, it was possible for this work to be done anywhere in the world, so long as the product of the work could be transmitted by telecommunications. Much of the world's software is now being written here. A great deal of the biotechnology which made the World Productivity Campaign a success was developed here in our islands.

Hawaii has many talented, creative people. Some of them have gone into software and teaching; some support our outstanding cultural events; and many are feverishly at work in the media industry, producing videos, movies, promos, graphics, customized dramas, and special effects for the experience industry. This industry was known 75 years ago as the “film industry,” when most people still went to a theater to watch movies, or stayed at home and watched nationally-syndicated programs on television.

Very few people know that Hollywood, California, used to be a production center for films. It is known to most of us today as an exclusive neighborhood for the rich. But there was in fact an industry there, once. As the film industry was impacted by video cassette recorders— remember your parents talk about them?— the market changed, the industry diversified geographically, and became segmented in subject matter. As Hollywood lost its hold, the Island of Kauai made a strong pitch to replace it, and at the turn of the century, Kauai was known as “Hollywood, Hawaii” and even “The Film Capital of the World.” Kauai is still a world leader in media production which requires a variety of natural scenery and settings.

Other types of production, of course, occur throughout the State. The personal videotaping of special events, beamed to friends around the world by satellite, is a popular Christmas present. There are personalized VideoCards for all occasions, VideoGrams for parties, VideoHistories of companies and families, and VideoSummaries of business meetings. A full line of custom-made products has kept many people employed in creative professional work.

The rapid expansion of the less developed countries has greatly increased the need for materials and minerals, and this finally stimulated the marine mining industry. Studies on manganese nodules and manganese crusts were conducted here and around the world in the 1970's and 1980's, but a

depression in the world minerals market, unfavorable Law of the Sea treaty terms, and the development of synthetic alternatives meant only a few mining operations existed at the turn of the century. Now, both the manganese nodules and the marine mineral crusts are being mined, using different technologies.

Seventy years ago in Hawaii, there was a lot of pessimism about the survival of agriculture in our Islands. Well, agriculture has survived, with premium sugars, pineapple, guava, papaya, coffee, macadamia nuts, passion fruit, square watermelon, foliage and cut flowers, cocoa beans, aloe, jojoba seeds, kukui nut oil products, and other crops.

Sugar has been written off every decade or two since 1835 when the first plantation was established at Koloa on Kauai. While total sugar production has declined, the production of energy, liquid fuels, chemicals, and by-products from sugar has kept the industry going.

Probably nobody here today would recall that orange juice was the accepted breakfast drink of the 20th century. Now, of course, guava juice is the international breakfast drink of choice. Guava juice, guava concentrate, guava crystals, guava popsicles— the world has fallen in love with guava. Overall, the agricultural products which have done well have been products which are exotic in taste and appearance, reminding people of their vacation experience in Hawaii.

Seventy years ago, there was an inkling that Ka'u on the Big Island was an excellent place, geographically, for space launching. Missiles launched at Ka'u would rise over the ocean on a preferred trajectory which did not endanger any land areas. The industry was not at first welcomed by the residents of Ka'u, but an accommodation was reached, and the industry was on its way.

Hawaii has been a world leader in aquaculture development since the 1970's. Focusing at first on prawns, the industry expanded to include saltwater shrimp, abalone, algae, lobsters, pan-sized *mahimahi*, eels, and many other varieties of marine life. The industry supplies the needs of local restaurants in serving our visitors, and many varieties are also competitive as exports. Much of the local industry is combined with OTEC, especially on our floating cities. The deep, cold, nutrient-rich water which is brought up in OTEC operations is pathogen-free, and can be mixed with warm water to create the right temperature for many different species.

Because of physical distance and the cost of freight, it has been difficult for Hawaii to compete in heavy manufacturing. Most of our manufacturing has therefore been high in value and low in weight. The manufacture and sale of jewelry is one such industry. With the increasing acceptance of plain bodysuits for all occasions, people own fewer clothes— perhaps only four or five basic bodysuits. As a result, more and more attention has been paid to the accoutrements— epaulets, pendants, rings, bracelets, and jeweled armstrap compu-phones. In some places, now, “changing clothes for dinner” means only a change in the pendant around one’s neck from a “daytime work” pendant to a “nighttime dress” pendant. Since bodysuits are not as expensive as clothing was in the last century, consumers have more money to spend on jewelry. Our multi-cultural creativity has served us well; our industry has blossomed.

I have been commenting on specific industries. Overall, how has our economy performed? Well, the Gross State Product has grown from \$11.3 billion in 1980 to \$1.5 trillion today. Adjusting for inflation, the GSP today is \$49 billion in 1980 dollars, or four times the real GSP of 70 years ago. This is a significant achievement.

The Gross State Product is not our only concern, however. While economic growth is crucial, and income is essential to

our standard of living, we have another index to measure our progress, and that is the Gross State Quality of Life, or GSQL.

The idea of a GSQL was one of the results of the extraordinary economic growth of the 1960's and 1970's— the 25 years after statehood. As the economy boomed, people became concerned about the impact of economic growth on lifestyles and the natural environment. People wanted economic growth, but not at the expense of social and environmental values.

The enactment of the Hawaii State Plan in 1978 established a system for weighing and evaluating a broad range of community values in making government decisions. Then in 1986 an effort began to measure the social impacts of the tourism industry on Hawaii, using social surveys, community journals, interviews, and newspaper scans. This was expanded over the years, until it was proposed that the attempt be made to measure the impact of all social, economic, and environmental changes in Hawaii as they relate to the quality of life of our residents. The GSQL was the result.

Major factors in the GSQL include the availability of jobs, the availability of housing, the availability of cultural and educational activities, per capita open space, per capita educational attainment, per capita recreational facilities, per capita health facilities, level of pollutants, infant mortality, per capita birth defects, rate of disease, life expectancy, time spent commuting to work, the crime rate, and the divorce rate. The GSQL is calculated for each County.

Social values are hard to measure— in some ways, they simply cannot be measured. Subjective data, obtained by surveys and interviews, relate to the perceived improvement or decline in the quality of life. The perceptions are based on lifestyle, fulfillment of personal goals, the quality of personal relationships, the availability of opportunities for growth, and the

degree to which one's daily life fulfills one's basic values.

Using 1990 as the GSQL base year with a value of 100, our GSQL today is 312. In short, we appear to have three times the quality of life as our forebears enjoyed 60 years ago. While this is certainly encouraging, it is noteworthy that our GSP quadrupled, while our GSQL only tripled. There is still much to be done to enhance the quality of life.

I don't believe we would have become so successful economically, had it not been for the Free Market Magna Carta and major changes in our educational system. These are the topics to which I will turn in the next two lectures.

LECTURE 5:

THE FREE MARKET MAGNA CARTA

A major issue which occupied our ancestors in the 1980's and 1990's was the appropriate role of government and business in the economy. As the debate progressed in the 1990's, two groups emerged— the “free marketeers,” and the “public gooders.”

The free marketeers argued for minimal government regulation. They believed that the free market would best allocate resources, no matter what the resources were. Anything which could be bought and sold should be bought and sold on an open market, without the distortions of government intervention. Anything else was inefficient.

In the free market system, everyone pursues his or her own self-interest, seeking economic gain, deciding what to buy and what not to buy. These millions of independent and self-interested decisions, the free marketeers argued, add up to what is most agreeable to society as a whole.

For example, if there is increased demand for bodysuits, then the pressure of demand on the supply of bodysuits will drive the price up, since people will be willing to pay more in order to get one. But these higher prices will stimulate additional production or attract new entrepreneurs who will enter the market and expand the supply. With greater supply, the prices will fall, because producers will lower the price to attract customers. Thus, supply and demand determine price for a specific commodity.

The free market mechanism is also efficient in allocating resources between commodities. If there is less demand for bodysuits but greater demand for VideoGrams, bodysuits will

remain unsold, their prices will fall, and producing bodysuits will become unprofitable for many producers. They will shift their resources to VideoGrams, where there is greater demand and potential profits. With fewer producers of bodysuits, supply decreases until it matches lower demand, and prices can rise to make bodysuit production profitable once more. With the production of more VideoGrams, supply increases to meet demand, and the prices fall due to competition and greater supply.

The type of goods, their supply, and their prices thus continually respond to market demand— the desires of consumers— both as to prices and preferences for different goods. If government interferes with the market, the free marketeers argued, there will be artificial barriers and incentives, and the free market cannot be efficient.

The free marketeers pointed out that it was the free market system which was the driving force which expanded the economy and increased the standard of living for all. Wherever the free market has been allowed to operate, the ordinary man has been able to greatly improve his lot in life. The wide gaps between rich and poor, they pointed out, exist in countries which do not allow the free market to operate.

There was another, deeper argument put forth by the free marketeers. They argued that the free market system offers individuals the most human dignity, and this leads to the highest productivity. The free market system maximizes individual choice and action, as well as individual responsibility and personal growth. It promotes innovation and creativity. It allows people to be truly alive, thinking, deciding, working, and getting direct feedback on the results of their efforts. It provides a context for individual opportunity that maximizes personal meaning through choice, and personal fulfillment through action. Other economic systems just do not work as well, because they do not offer the individual the motivation or

meaning to perform at his or her best.

The public gooders saw things differently. They began by distinguishing between private goods and public goods. Private goods, they said, were things like hovercraft and bodysuits and VideoCam machines. Public goods, they said, were land, water, and air. They argued that private goods should be traded as freely as possible on the free market, while public goods should be regulated by government on behalf of the general public. This is because public goods are not “mere commodities.” Land, water, and air were not created by the labor of man—rather, they are the gift of Providence, the inheritance of all human beings. They are the basis for all human life and labor, and must be used for the good of all.

Public gooders agreed that the theory of the free market was an elegant theory intellectually, but they said that the theory encompassed either too much or too little. If the free market theory attempted to include all human values and motivations, then the theory must maintain that people have only economic values, and always act only for economic gain. This economic gain must be imputed, somehow, even when no money is actually paid or received. This requires the free market economist to put a dollar price tag on actions motivated by idealism, philosophy, religion, or affection. On the other hand, if it is admitted that the market does not incorporate all human values, then the market is not enough, and there is a need for a mechanism to express those other values. Those other values must be expressed through democracy, politics, and government.

The argument from the public gooders’ point of view was that life is larger than the market. The market does not bear all human values— it is not supposed to. In fact, the public gooders argued that the biggest threat to the free market was expecting too much from it. If people expected too much from it, then, when it could not deliver, or it delivered the wrong thing,

people would attack it or seek to reduce its role.

The public gooders saw two reasons for government intervention in the market place. First, it had to be admitted by all parties that from time to time there was fraud or abuse in the private sector. The public gooders said that in such cases, the government must step in to investigate and regulate business so that such abuses would not recur. A second reason for government action was that some things, like water and air, are a “commons” which must not be ruined, and only a government can prevent that, by acting on behalf of all the people.

The “tragedy of the commons” was first enunciated by a scholar named Garrett Hardin in 1968. His example was of a pasture which was open to all the herdsman. The tendency, he said, is for each herdsman to keep as many cattle as possible on the commons. So long as there aren't too many cattle, and all can be accommodated, all is well. But the number of cattle will increase, because of the inherent logic of the commons which remorselessly generates tragedy.

Each herdsman seeks to maximize his gain. By adding another animal to his herd, he receives the positive proceeds of the sale of that additional animal, +1. On the other hand, the effects of overgrazing in the pasture are shared by all the herdsman, so the negative impact on that one herdsman is only a fraction of -1. He gains far more as an individual than he loses as a member of the group.

Since all the herdsman will come to the same conclusion, they will all logically and rationally keep adding to their herds, until the pasture is overgrazed and destroyed for all. Each herdsman pursues his own individual best interest, as he is supposed to do in the free market, but because the pasture is a commons, that freedom leads to ruin for everybody.

The same is true of pollution. The cost to each individual, or

company, of polluting the environment is less than what it would cost each individual or company to control his or her activities to prevent pollution. This is true for everyone, so polluting is “economically rational and efficient” for each individual or company— but it leads to polluting the entire environment for everybody. In the case of a commons, the independent, free-enterpriser behaves in a manner which fouls his own nest.

Government must therefore step in to preserve a commons. Laws and regulations can limit the number of cattle in the herd, so that overgrazing does not occur. Government can legislate and enforce environmental regulations which make it uneconomical for each individual or company to pollute. Only in this way can the tragedy of the commons be prevented.

Some free marketeers admitted that these were good reasons for government involvement, but argued that the burden of meeting government regulations mounted year after year, with no end in sight. By the 1980's, it was estimated that the private sector had to fill out more than 4,400 federal government forms each year. The total cost of private sector compliance with federal regulations was estimated at about \$100 billion in 1980 dollars. Most of that cost, of course, was passed on to consumers. It was estimated that federal regulations cost \$500 for every man, woman, and child in America in 1979. This was too big a burden.

The aspect of the debate which most concerned the general public was land use. There was concern about the relentless increase in urbanized land. More and more of Hawaii was becoming buried in concrete. The logic of the free market was to treat land as a commodity, subject to speculation. The way to get the most for this commodity was to hold it until the price rose, or develop it to its “highest and best use”— urban use. The market pressure was thus to redistrict and rezone land from agriculture or conservation to urban.

Many petitions from developers and landowners were turned down by government regulatory agencies, but still, year by year, the islands became more urbanized. The amount of agricultural land and open scenic space continued to diminish. And there appeared to be no end in sight— no hope of a solution. The only government plan was to slow down the inevitable urbanization.

Government delaying tactics were thought by free marketeers and many others to be unfair. The government would not allow the redistricting of agricultural land, even after it was no longer being cultivated and was lying fallow. The government applied regulations which prevented urban uses even on lands already districted for urban use. The developers and landowners argued that this was an unconstitutional “taking.” But in any event, it was not a solution, only a delaying tactic.

In search of a solution, a series of facilitated meetings among free marketeers and public gooders began in 2003. By the next year, 2004, a compromise concept had emerged, which was adopted by the State Legislature in 2005 as part of the Hawaii State Plan. We all know it today as the Free Market Magna Carta. Essentially, the Free Market Magna Carta made private goods more private, and public goods more public.

It was agreed that government regulation of private goods traded on the free market was too detailed, oppressive, and expensive for the economy to bear. It was too great a burden for small, innovative businesses— the very businesses on which the economy depended. Thus, government regulation of the purchase and sale of private goods was reduced. The remaining government regulation focused on health, safety, and the prosecution of fraud. This left the free market with a largely unregulated, highly competitive market, which stimulated new investment and innovation. This was the new freedom which made it a “Magna Carta” for the free market.

While private goods became more private, public goods became more public. It was agreed that public goods are properly under the control, ownership, or regulation of the public sector. Many values of society are not internalized in the free market, and are not reflected in the decisions of company executives. In order for aesthetic, spiritual, and moral values to be reflected, the custodian of those values— the government— would have to take action. That action would be stronger control over land, water, and air.

As for air, there were no established ownership rights, so government merely regulated air quality. As for water and land, the government strategy was to fulfill public non-market values by taking more of these resources out of the market through government purchases or some other means of compensation. The government bought some private water rights, to increase the amount of water which could be allocated for public purposes. It also bought land in fee simple and purchased some development rights. This solved the constitutional “taking” problem. Meanwhile, most of the land purchased by the government was leased back to agriculturalists, dedicated for open space, or set aside for wildlife refuges.

In embarking on the public purchase of land, government planners identified those lands which were most crucial ecologically and aesthetically for the survival of unique flora and fauna and the enjoyment of the people. The list of key parcels was published and debated. The government then began the systematic acquisition of the land, in a major effort which has lasted 45 years. It is sometimes referred to as the Second Mahele (not to be confused with a proposal made by a State governor in 1961). In an important sense, it returned land to the people, because it opened the land to public use, and it preserved the land for future generations.

By purchasing these lands, major battles over land use diminished, and the future of our natural environment was

assured. It was timely, because the migration to the sea made large amounts of coastal land available for purchase. While the purchase of land at market rates was terribly expensive, money was found, primarily as a result of the reduced need for school buildings and highways. Looking back, the cost of acquiring so many thousands of acres appears small compared with current prices and the value of public enjoyment.

Today, we benefit immensely from the continuation of agriculture, the large green belts between cluster neighborhoods, the open beach fronts, and the vast number of parks and playgrounds which those government purchases made possible. We also benefit by knowing that, for the most part, our unique flora and fauna are being protected, and there is no longer a market drive to urbanize the land where endangered species live.

There is another reason that this Second Mahele was timely, and that had to do with trends in housing. As more and more of our people began to live in modules and small apartments, there was a corresponding need for more public space and facilities. More and more people “lived” outside their homes. When their private living space shrank, they needed larger public living spaces.

Thus, the effort was made to create more “public wealth.” The acquisition of parks was a beginning. The trend extended, however, to include more and more public buildings and facilities for meetings, sports, and entertainment. This tended to equalize the quality of life, and provide a minimum standard of living for all to enjoy regardless of position or private wealth. Many people feel that this has made democracy and equality more of a reality than in the last century.

LECTURE 6:

EDUCATION AND EDUCOMP

You may recall that I said earlier that the significant economic growth we experienced in the last 50 years would not have occurred had it not been for the Free Market Magna Carta, which we discussed in the last lecture, and major changes in the educational system, which I would like to discuss tonight.

By the 1980's it was clear that education was the foundation of innovation and entrepreneurial success in our economy. In a knowledge economy, we needed creative thinkers. Everybody seemed to agree on that. But they did not agree on whether we were in fact producing creative thinkers, and if so, whether we were producing enough. This was a hotly debated issue.

For convenience, I will characterize the arguments as falling in two different camps. I shall call one camp the traditionalists, and the other camp the individualists.

The traditionalists were largely satisfied with the educational system. They admitted that the system might appear to be rigid, but they maintained that students needed to learn discipline in school. They also supported the idea of testing students and placing them in "fast," "medium," and "slow" classes, because they felt that the talents and abilities of all students should be identified early, so they could be sorted out in advance for future employers. While they admitted that people have different talents and abilities, not all of which are easily measured, they felt that all students should be tested regularly on standard information which all must learn to graduate and be certified for work.

The traditionalists wanted to improve the school buildings, the equipment, and the educational requirements. They also

wanted to raise the salaries of teachers, and reduce the teacher/student ratio. On the whole, however, they were proud of what American education had accomplished. The American educational system had provided opportunities for generations of Americans who came from all over the world, helping them to rise to the level of their abilities. Equal access to education was central to the American democratic ideal, and it had worked. The traditionalists usually ended their statements with something to the effect that, "If it isn't broken, don't fix it." The traditionalists reacted badly to fundamental criticism of the system.

Fundamental criticism was precisely the thrust of the individualists, who challenged virtually every tenet of the existing system. The individualists agreed that the traditional educational system had worked well in the 19th century, but they argued that fundamental changes in society and the economy made drastic change necessary. I will summarize their argument as follows.

All children are born with natural curiosity and enthusiasm for learning. It is part of the survival of the species. As every parent knows, every child explores his or her environment, and once he or she learns to speak, will pester any available adult, indefinitely, with questions. Why is the sky blue? Why is there air? That natural curiosity and enthusiasm are the basis of learning and creating, and yet it is that natural curiosity and enthusiasm which is being crushed by the traditional school system. Children began school bright and interested, and emerged 12 or 16 or 20 years later as dull, uninspired adults. And this was no accident, if one believed the individualists.

The reason this occurred, they said, was that schools were bent on preparing their students for life in industrial society, specifically the factory. The educational system was designed to generate uniformity, so that young people would fit into factory life.

Beginning with the industrial revolution in the 19th century, educational systems had two curricula. The ostensible curriculum was math, English, and literature. The real, or underlying curriculum was not a subject but a method or process. The real curriculum was teaching masses of students how to be punctual, to be obedient to authority, and to accept boring, repetitive work. That was what the factory required, so that was how students were prepared for life. They sat in the classroom in lines and rows, facing forward, listening dutifully to the teacher, doing boring, repetitive work.

It went further than that. Educational systems also sorted students into different categories and rated their abilities. They were measured against standardized tests. When they graduated, they were rated and graded and stamped “approved” like different grades of beef. The factory system received them, already rated and sorted, and knew where to put them on the assembly line.

The individualists claimed that whatever had been the merits of such a system in the 19th century, our society was now in the post-industrial age, or the information age, and preparation for life in a factory was no longer appropriate— except for robots. The factory was no longer the major workplace of our people. The national economy was now dominated by service industries, and knowledge was now the primary resource. Economic growth and success depended not on uniformity but on creativity, innovation, individual initiative, and individual responsibility.

The educational system, according to the individualists, had to be redesigned completely, from the bottom up. It had to be built on the encouragement of the natural curiosity and enthusiasm of the child, and it required individual coaching and attention, with total flexibility on schedules, deadlines, and each student’s rate of growth in the pursuit of knowledge.

So those were the battle lines. You will not be surprised that very little changed as a result of the debate. The traditionalists became overly defensive, the individualists became overly arrogant, and nobody was especially happy.

While many people and events led to the breakthrough, I would like to highlight two. First, I would like to applaud a wonderful senior citizen named Naomi Kapunia Nakabayashi, a retired school teacher, who launched what became known as “Kupuna Power.” This marvelous woman looked at all the students, unhappy sitting in classrooms with little individual attention, and all the senior citizens, unhappy sitting at home with little individual attention, and she put them together. She declared that the students and the *kupuna* needed each other, and at the tender age of 68, she launched a campaign to bring them together.

The two basic tenets of her campaign were that, first, it was not necessary to sit in a classroom to learn things, and second, that the world was full of teachers— it was just that they were not all certified graduates of Colleges of Education. She declared further that the *kupuna*, the elders, had much to teach, and one reason our society had been unhappy for a hundred years was that we were not allowing them to teach, but were shunting them aside.

Naomi Kapunia Nakabayashi stumped the State, giving speeches, writing letters, attending Board of Education meetings, and organizing both students and elders to make their case. Within the first year, 3,000 retired citizens came forward to donate their time. The following year, another 7,000 signed up.

Most of the elders who signed up had been living active lives, with a keen interest in the world. Their role as *kapuna* gave them a new focus for their activities and interests. Others, however, had lost the will to live, and were lying quietly in their

nursing homes, merely subsisting from day to day, waiting for death to come. Naomi found them there, and challenged them. A few of them literally arose from their sickbeds, became well, and began to live again. According to the attending physicians, there were miracles the likes of which had not been recorded since Biblical times.

It is hard to measure the effect of this campaign, but by any measurement, it was extraordinary. The programs which grew up resembled the Big Brothers, Big Sisters, and Foster Grandparents programs of the 1970's and 1980's. It was difficult at first to match students with *kupuna*. Many were matched with their own grandparents, aunts, and uncles, and this tended to insure an easy start-up. For students and elders who had never met, many were apprehensive— one student said “terrified”— at their first meeting. Soon, however, students and elders could be seen at parks, along the beach, in libraries, and in homes, talking and reading and making things. The *kupuna* taught what they knew, and learned new things, to keep up with their students.

A random check in the first few years found that more students attended their tutorials with their *kupuna* than attended regular classes. Many students became fiercely proud and protective of their *kupuna*. The *kupuna*, for their part, lived for their students. Many of them had no one left in the world, or their families and friends lived elsewhere, or had forgotten them. With their students, they started new “families.”

In the middle of it all, for nearly 15 years, was Naomi Kapuniai Nakabayashi, patient, energetic, indomitable. When she began, she was the terror of every school administration in the State. When she passed away at the age of 83, she was honored as a saint. To quote her, “No society can be rich or healthy if the *kapuna* and *keiki* don't talk to each other.” Our society is richer and healthier today because of her.

Kupuna Power succeeded in de-emphasizing the importance of buildings, and broadened the definition of “teacher.” It got students out of the classroom, and built new networks of friendship and respect within the community. The individualists strongly supported Kupuna Power. Most traditionalists accepted it, and some participated as *kupuna*. However, the traditionalists were opposed to any further changes in the basic educational system. The debate continued to rage, until it was resolved not by logic or intellect but by technology: the armstrap computer/telephone.

Certainly, the trends were clear. There were the mini-computers, then the micro-computers, then the home computers, then the portable 20-pound computers, then the small briefcase travel computers. At the same time, there were standard-sized cellular phones, and then pocket telephones, and then wristwatch telephones (finally fulfilling the technology of the *Dick Tracy* cartoon strip of the 1950's). Meanwhile, more and more communications satellites were being launched, and more and more information systems were being developed and sold for use by computer hookup. The software lagged behind the hardware development, but by the middle 1980's it was possible to hook one's computer up with a number of international information systems for a reasonable fee.

For quite a while, the educational establishment did not respond. Courses in computer literacy were introduced, and were obviously beneficial. Some students used their home computers to do their research by accessing information systems and printing out their reports. Later, students used pocket-sized computer tutors to cram for history, foreign languages, math, and science exams. However, in the classroom, students still used books, pencils, and blue-lined paper. Leading educators saw what was coming, but old habits die hard.

What was coming, and what arrived in 2010, was the

armstrap computer telephone, or compu-phone. The armstrap compu-phone is usually six inches long, two inches wide, and a quarter inch thick. It is strapped along the forearm, beginning with the wrist and reaching back toward the elbow. It is viewed as one used to view one's wristwatch, but it can do virtually everything. It is a telephone; it is a computer; it is a calculator; and it can access all the information known to the modern world. You can telephone a friend anywhere in the world. You can signal for help in an emergency. You can access an information system to identify the major plays of Shakespeare, and you can read those plays, which will appear in scrolling fashion on the armscreen. You can call up study programs and teach yourself any one of 684 subjects. Once personalized information is entered in the compu-phone program, it will remind one of important birthdays and anniversaries; will schedule your appointments; and will order needed supplies at pre-set intervals. The current balance in one's Unit Transfer Account is only a touch away.

With the arrival of the armstrap compu-phone, any student anywhere in the world could dial anybody, or could dial into any information system, and talk to people or to computers, and get an auditory or visual response to specific questions, at any time, day or night. There were already international networks of information for students with EduComp, EduCalc, InstaLibrary, and SpeedFact. In short, anybody with a compu-phone could track down any non-proprietary information available to anybody in the world, usually within a few seconds.

This drastically changed the role of the teacher and educational institutions. Teachers were no longer needed to provide information. They are now Masters, or counselors, encouraging and guiding the independent research and activities of their students.

Some Masters are technical experts, coaching their students in technical skills. They focus on the ability to attain and maintain

high standards of performance and craftsmanship. Other Masters are human relations experts, sharing their wisdom, ethics, values, and philosophy. They focus on the meaning and purpose of human endeavor. Other Masters are analysts, coaching their students on logic and the relationship of facts and ideas. They challenge their students to think critically about information and make constructive decisions.

As you all know, the status of our teachers has grown greatly as a result of all this. And our students, with free access to virtually all knowledge, and the support of *kupuna* and Masters, learn extremely well and extremely quickly. A recent study has indicated that the natural curiosity of each child is now being liberated to the extent that the rate of learning and information mastery has increased approximately six times in the last 75 years. It is said that the fifteen-year-old of today has digested as much information as the Ph.D. of the last century.

The trend in education in the last century was toward greater and greater specialization and fragmentation. By the turn of the century, it was clear that this trend would have to be reversed— we needed more people who understood the broader values of society and how to integrate knowledge for action. In short, we needed more people who were liberally educated, and were skillful in human relations.

Education has thus reversed its focus. All of the things which were called “extra-curricular activities” in the 20th century are the primary curriculum in the 21st century. Before, students were taught “what,” but not “how.” Today, we teach them “how” because it is easy enough for them to learn “what.” We teach them “how” through group activities in our schools and universities. These activities provide the framework for learning about oneself and others; about the management of conflict and the benefits of cooperation; about values and ethics; and about the content and purpose of life.

For the most part, students today pursue their interests wherever they please— at home, outdoors, with their *kupuna* and Masters, with their friends, with their parents, wherever. With all the knowledge of the world at their fingertips— literally— it does not matter where they are.

Our schools and universities are still important because human beings are social by nature, and the formal curriculum today is focused on human relations skills and social cooperation. Our schools and universities provide places for group activities such as sports, theater, clubs, joint projects, and the like. Schools also provide special equipment and laboratories too expensive for each student to have at home.

One major difference between the educational system of today and that of 75 years ago is that today's system is more effective at only a fraction of the previous cost. Many teachers are volunteers; most information is conveyed not by teachers but by compu-phones, which are not expensive; little time is spent on administrative paperwork; and there are fewer buildings to build and maintain. Seventy-five years ago, we were spending one third of the entire state government budget on education. Today, we spend only one tenth of our entire budget, and we are much happier with the results.

LECTURE 7:

DDT, VITAMINS AND GREENIES

This lecture, I am afraid, will not be pleasant. I must, alas, describe the incredible arrogance and stupidity of the late 20th and early 21st centuries in regard to the natural environment. Fortunately, the story has a relatively happy ending. We have corrected many of the wrongs, and have gained new humility and intelligence. The worst is now history. But we should not forget, and we must not repeat, these grievous errors of the past.

Our forebears a hundred years ago thought they could do anything they pleased to the natural environment. Many thought that they were superior to the natural environment— smarter, somehow, than the accumulated intelligence embodied in natural ecology and human biology. These people, infatuated with themselves and the technology they created, had no respect for the natural world.

Certainly, many good things have been accomplished by human beings through new technology. Our standard of living has risen; more people live longer; there is a greater variety of jobs; there are more opportunities for personal growth; more human beings find more meaning in their daily lives. Economic development has made these good things a reality. We are all grateful for the technology which has supported this economic growth and the resulting improvement in our lives.

But not all technologies are the same, and not all have the same impacts. What happened was that many technologists became too narrowly focused on their specific task or product, and could no longer see the whole complex system of life on this planet. Some of these technologists were simply not interested in the environmental impacts of their products and

procedures. Others knew that there was a better way environmentally, but they rejected that way because it was more expensive financially.

For whatever reason, the period 1950-2000 was a distressing period in the history of America's natural environment. After the Second World War, there was an explosion of enthusiasm for technology. Much technology had been developed during the war; the war had been won; there was a new faith in progress, much like that which existed in the late 19th century. There was an idealistic fervor. Much of the fervor was noble, but it was environmentally blind.

The nation pursued nuclear energy, for example, without knowing how to solve the problem of the long-term disposal of radioactive nuclear waste. The excitement over the potential uses of nuclear power was so strong that leaders even proposed using small nuclear bombs in large construction projects to dig tunnels and change the course of rivers. There was no idea of the dangers of radioactive fallout on nearby plant, animal, and human populations.

Pesticides were developed and introduced. Laboratory tests showed they were effective in killing specific species, but there was little or no thought to the devastating effect they could have on an entire eco-system. Millions of tons of poisonous chemicals were sprayed across the country's farmlands. It is true that the target bugs died; but so did birds, worms, dogs, and other animals. As the bugs developed strains which resisted specific pesticides, other pesticides were introduced, and the wholesale poisoning of the environment continued. The winds and rivers and ocean currents spread the poison; DDT was found in penguins in the Antarctic. These new "miracle" pesticides did not break down organically. There was no escape.

The world became plastic. More and more materials were

produced which were not naturally biodegradable. Detergents which did not break down replaced the old-fashioned soaps which did. Synthetic cloth replaced cotton. Gadgets crowded houses and apartments; the disposable society reigned. Factory waste was disposed in rivers and lakes; fish were found floating dead on the water's surface. Trash piled up, and was taken to landfills. Water trickled down through those landfills, and the leachate reached water tables, poisoning them, and forcing the closure of the wells.

The trend was frightening. Voices were raised, but were largely ignored or silenced by the seemingly sincere and authoritative responses of governments and company laboratories. Finally, the physical evidence of environmental damage was too obvious. An environmental movement arose in the late 1960's. By the early 1970's, the nation and many states had passed environmental legislation in an attempt to reduce and eventually solve the problem.

Progress was slow, but its focus was clear: find natural solutions to natural problems. Work with nature, not against it. The answer was not to control or dominate the environment, but to participate in it. Human beings could indeed have economic development. It just had to be done in a manner which was environmentally sound.

Natural energy was thus preferable to nuclear energy. Biological engineering was superior to pesticides. Organic products which were biodegradable were preferable to those which were not. This natural approach required immense knowledge of the environment and chemistry, but such knowledge was available or could be attained. By the 1980's, major new research programs were underway in both the public and private sectors.

Important adjustments had to be made. When farmers shifted from tons of chemical fertilizers to the recycling of waste,

productivity per acre declined, so more acres had to be planted. This meant that the federal government no longer needed a program to withhold large amounts of land from planting in order to reduce output and stabilize prices. On the other hand, with fewer chemicals, not every papaya or apple or orange looked perfect; customers begrudgingly got used to eating fruit which tasted delicious, but did not look as inviting as in the old days.

Sometimes, pests could not be controlled fast enough by the introduction of biological predators, and crops were lost. Potential losses were alleviated to some extent by growing many different crops, so major pests which preyed on only one crop did not develop large populations, and if they did, not all crops on a single farm would suffer. In addition, diverse gene pools for seeds for the same crop were maintained, to increase resistance to a single blight or predator.

All these changes created problems. However, fertilizers and pesticides were no longer dripping down into the water table and poisoning rivers and lakes. The fish began to return; birds once more built nests in neighborhoods; there were fewer reports of headaches and illness in farming communities.

The manufacturing sector also changed. Goods were produced which were more durable, and were designed to last. They cost more, but because they lasted longer, the life-cycle cost was lower. There was less trash; there were fewer landfills. Biodegradable plastics appeared; wood and cotton and iron became fashionable again. The standard of living was still high. Industry was just producing and marketing more natural, organic products than before.

As we all know, virtually everything is now recycled. The ecology of Earth is now recognized to be a single closed system— “Bucky” Fuller’s “Spaceship Earth.” It is commonly said that a pollutant is just a misplaced resource. Uses for

pollutants have been found, so they no longer pollute, but contribute to the economy and our high standard of living.

By the beginning of the 21st century, we were on the road to sanity and recovery. Ecologists were busy restoring natural habitats, and re-introducing species known to have lived in those habitats. Fewer toxic substances were being used, so there were fewer “spills,” and fewer official dumpsites were needed. The nuclear energy industry was in decline, with less and less nuclear waste to be disposed.

Here in Hawaii, our expertise in biotechnology made us an early leader in biological engineering to eliminate the fruit fly, reduce and eliminate pesticides, and diversify our gene pools and crops against blight and predators. We did not have nuclear power plants, so we did not have a major nuclear waste disposal problem. Meanwhile, our efforts in renewable energy have included garbage-to-energy plants which have reduced our need for landfill, and have protected our water table from leachate. Our migration to the sea, and the purchase of large tracts of land by the government, allowed for the regeneration and protection of hundreds of endangered species in new wildlife parks. While supportive of technology, we in Hawaii began efforts in the 1970’s to assess potential new technologies before they are introduced into society. Technology assessment has given us the opportunity to explore in advance whether the new technology appears to be favorable, and if so, how we can maximize its benefits and minimize its costs. Hawaii is now an international research center in technology assessment.

It was noticed in the 1980’s that the average temperature in Honolulu had risen. An investigation revealed that one reason was the vast increase in the amount of concrete and asphalt laid down during the previous 30 years. Where green trees and fields had once stood, there were now condominiums, hotels, office buildings, homes, highways, and parking lots. The concrete and asphalt absorbed the heat. There was another

dimension to the situation: less oxygen. Plants convert carbon dioxide into oxygen. For example, an acre of grass produces enough oxygen for one human being. With fewer plants, there was not only more heat, but less oxygen for us to breathe.

In 1985 a first step was taken. It was a program known as "A Million Trees of Aloha." During that year, a million trees were planted throughout the state by students, corporations, unions, farmers, and citizens. Then in 1994 a group known as the Outdoor Circle took a further step. Subsequently known as "the Greenies," they decided to cover the concrete and asphalt with green plants which would cool down our city and increase our oxygen. Working with botanists, architects, and city planners, they identified hardy vines and small plants which could be grown on balconies, rooftops, and parking lots. Every flat surface was a candidate growing space.

Enlisting the support of government, corporate, and community leaders, the Greenies launched their campaign in 1995. Public funds and private donations were so substantial that the plants were distributed free. Flower boxes, planters, soil and humus were sold at low prices at participating nurseries. The Greenies designed and sold prefabricated wooden frames or trellises which could be erected one or two feet above any roof to string the vines. Tall trellises, ten feet or higher, were sold for ground-level parking lots, where they created shade for the cars. The normal sun and rain were enough to make the plants grow.

Within a year, it was obvious that the campaign had worked. The green plants were indeed cooling Honolulu. The ambient air temperature dropped several degrees in the downtown area. The cost of air-conditioning went down, paying for the trellises many times over. The rainwater soaked up by the plants made good use of water which would otherwise have gone down the drain and out to sea. The city became more beautiful. And there are those who speculate that, with the additional oxygen,

everybody began thinking a little more clearly.

As we learned to work with the external natural environment, we also learned how to work with our internal natural environment. Here I refer to human nutrition and biology. This subject is rather sensitive even today, since it reflects so badly on our forebears and the vested interests of a few professionals and companies. Fortunately, the worst is behind us.

On the brighter side, we are now far more able to monitor human biology than ever thought possible. The introduction of microfine probes has given us a distant early warning system. These probes, which today come with most bodysuits, are tiny, nearly invisible, painless “needles” which are worn inserted into the body to sample blood, monitor the pulse, and record the existence or development of malignant cells. These data are monitored through personal compu-phones by a central medical computer system which alerts both the individual and his or her doctor when blood, pulse, or malignant cells indicate danger. The patient receives instructions from the computer or the doctor, through the patient’s compu-phone. Computers have also been extremely useful in analyzing the medical histories and symptoms of patients, for possible diagnoses.

While medical technology was moving forward, and was dealing more and more effectively with diseases after they arose, there was little progress in the prevention of those diseases. We know now that many diseases could have been prevented in the second half of the 20th century, using information already available then. This information was about nutrition— about using the human body’s own natural defenses and systems to prevent illness.

By the middle of the 20th century, most people lived in cities, where they no longer got daily exercise such as their forebears did on the farm. Food content changed. Because food distribution systems involved many days and many miles,

food processors added preservatives and took out nutrients so that food would not spoil in transit, and would have a long shelf life. Eating habits changed. More people drank soft drinks and ate candy bars, loaded up with coffee and pastries, and downed beer and pretzels instead of consuming more complete, balanced, nutritional meals.

At the same time, there was an increase in heart disease, cancer, and physical deformities at birth. People of all ages dropped dead of heart attacks. Cancers of all types seemed to strike at random. Pregnant mothers, smoking and drinking and eating candy, gave birth to children with disabilities.

By the 1950's, it was clear that poor nutrition and disease were related, and the relationship was often a cause-and-effect one. It was estimated that the high incidence of these tragic diseases would continue until two things happened: (1) people knew more about nutrition, and the connection between nutrition and disease, and (2) food distribution was localized, for fresher produce and fewer preservatives.

Voices were raised, and the word went out, but it didn't go out very far. The fact was that if everybody knew about nutrition, and practiced good nutrition, major vested interests would lose economically: the medical profession, the drug companies, and the giant food and drink companies. These interests fought back. They attacked the nutritionists who raised concerns, and they hired their own nutritionists to conduct studies which would demonstrate that all was well.

In those days, medical doctors did not study nutrition— few medical schools even offered courses in the subject. Instead, doctors studied anatomy, disease, and “wonder drugs.” Little was known about the effects of the drugs, especially when more than one drug was administered to the same patient at the same time. Food and drink companies continued to tout their products as being far more nutritious than independent

studies indicated.

The nutrition movement began in the 1960's at about the same time as the environmental movement. One by one, researchers announced that they had discovered the connection between nutritional deficiencies and disease. Health food stores sprang up. The movement had all the trappings of a fad, but it stuck. By the 1980's, a new generation of young, upwardly mobile professionals known as "yuppies" began to emphasize physical fitness, good diet, and "wellness." Wellness Centers and programs were established; the emphasis shifted to health maintenance. Nutrition became a more widespread concern.

As the connection between nutrition and disease became firmly established, there was also considerable confusion. Not everybody, it was known, had the same metabolism or the same genetic code. Some people need more of one kind of nutrient than other people in order to be healthy. Some people were "fast oxidizers" who handled sugar well; others were "slow oxidizers" who handled protein well. Some people were vulnerable to certain chemicals, others were not. For some, more protein would be good; for others, more carbohydrate; for others, more fiber; for others, more minerals than the "average" consumption. It was not possible to give detailed advice to all human beings, beyond the recognized need for reasonable sleep, exercise, and a balanced diet.

This changed in 2011, with the development of NutriScan. With NutriScan, it is possible to analyze each individual's unique genetic code and nutritional requirements, in order to overcome the effects of genetic deficiencies, avoid foods which one's body does not handle well, and take the precise nutritional supplements which are needed. While the analysis is expensive, and people do not always act on their NutriScan results, we have greatly improved our health. Life expectancy is now up to 96 for Hawaii and 93 for the nation.

Today, doctors, drug companies, and food and drink companies are far more oriented to the whole person— the person's nutritional requirements, psychology, personal development, and preventive health care. Doctors cannot be licensed without passing tests on nutrition. Drugs are still manufactured and used, but they are used as the last resort. With the spread of knowledge about nutrition, more people have demanded more nutritious food and drink, and more people are able to adjust the nature of their food intake to match their level of stress and specific genetic needs.

It is painful to note that millions of birth defects, heart attacks, and deaths by cancer could have been avoided 75 years ago, if only more people had studied nutrition and acted on the available information. Looking back, the arrogance of members of the medical profession and the greed of certain food and drug companies is astonishing and tragic.

Perhaps all that pain and suffering was a sad but meaningful down-payment on a happier future for us all. The lesson we have learned is that nature has marvelous self-protecting systems. If we nourish them, and work with them, we will be healthy. We need our doctors and drugs as allies, not as enemies. This new alliance has finally come to pass. The age of arrogance and stupidity is now a chastening memory. With humility, we embark on new research to become closer to our partner— the body's natural systems.

LECTURE 8:

DAILY LIFE AND TIMES

We have talked of major movements in the economy, business, education, the environment, and nutrition. But what about daily life? What are the themes of the last 75 years in terms of the social life of our people?

Perhaps the most important development has been freedom from want. Today, every human being in Hawaii has adequate food, clothing, shelter, and health care, no matter what that person's financial condition happens to be.

This has been true for a generation, now. This situation was made possible by the increase in the use of industrial robots, and the arrival of the long-awaited "cybernetic age." While almost all of us are busy with activities we call "work," less and less of our work has gone to the production of food, clothing, and shelter. The basic necessities of life are produced with little human labor, and they are in abundance.

Even with the advent of abundance, it was difficult for a majority of our citizens to decide whether and how to share that abundance with those who did not "work." The issue of a "guaranteed income" or "negative income tax" or "social support system" was debated for decades. It was not an easy issue.

On the one hand, it was felt that people should work for their standard of living, and if there was a "cushion" to fall back on, people would not work as hard, or would become permanently dependent on handouts from those people who did work. By the 1980's and 1990's, the government welfare system had supported several generations of families who did not work, and therefore did not contribute their effort to the community welfare.

On the other hand, it did not seem humane or moral to allow people to starve, or suffer a lack of clothing and shelter, for *any* reason— especially in the midst of general plenty. It was felt that it was not an issue of economic incentives, but of loving and caring for those who were not as well off. Not everybody was capable of working, or properly motivated to work, but such people were still our brothers and sisters. They deserved our support because they were human beings. So-called primitive human societies and even the higher animals share what they have, unless there is a true shortage. Since in our economy there was not a true shortage, we should share what we had. People who do not work should be helped to find work, but they should not have to starve or wander, shivering in the dark, until work is found.

At the turn of the century a compromise was reached, which has been in effect for fifty years. First of all, the Human Services Center provides food, clothing, and shelter for any human being who requests it. There are no forms to fill out; no qualifications or disqualifications; no limits or questions. There are only two requirements— one must go to the Center to receive help, and while there, one must contribute four hours per day to community service. Help includes counseling, assistance with job-seeking, job training, problem-solving, and so forth. Thus, each person works, and each person is fed, clothed, sheltered, and assisted in becoming more self-reliant. The Center serves families as well as individuals.

The Human Services Center is a charitable non-profit organization supported by both the public and private sectors. The food, clothing, shelter and assistance provide a minimum of physical and psychological support, to reduce and where possible eliminate suffering. However, incentives for self-improvement remain. It is human nature to want more than the minimum. No value units are transferred into a person's Unit Transfer Account; the person has no "money" to spend on discretionary items. To enjoy the better things in life, for oneself

and one's family, one must work to earn the extra income and have greater financial discretion.

Of course, "working" is now more broadly defined than it was 75 years ago. It means to participate and contribute to the life of the community. This can be in a formal job in a company or business, the government, or a non-profit corporation. But it can also mean the contribution of time and effort in volunteer activities. Certified community volunteers are not "hired," but are paid indirectly, through income tax credits which have been established to recognize benefits received by the community from individuals.

Seventy-five years ago, the nuclear family— two parents and immediate children— was the norm. However, it was falling apart under the pressures of daily life. While the marriage rate was high, the divorce rate was also high. Long work days, careers which headed in different directions, and a lack of human understanding and human skills resulted in husbands and wives drifting apart, and then parting, leaving children isolated. Many families thus consisted of a single parent with children. As this became common, it became accepted, and expected, and marriage was seen as a temporary alliance, not a permanent union.

Many futurists of 75 years ago predicted the end of the family. Sociobiologists, on the other hand, expected no such thing. Research in genetics, biology, sociology, and psychology indicated that the family, defined broadly as a set of closely related adults with their children, was one of the universals of human social organization. The family has overcome social stress many times in many cultures and countries.

The sociobiologists turned out to be right. Two trends have supported the return of a strong family unit. One is the vast increase in social skills. Our educational system has focused more and more on human relations skills, including marriage

and parenting. Far greater emphasis has been placed on interpersonal communication and coordination. We are far more sensitive today to each other's tone of voice, body language, moods, desires, and needs. We are far better at knowing when to help and when to step back, when to encourage and when to say nothing. We are better at seeking "win-win" solutions. We still have divorce and family problems, but we are doing far better than our ancestors. It is sad to look at the statistics of 75 years ago, and realize how much pain and suffering our forebears endured. Much of that pain and suffering, we know today, was not necessary.

The second factor in the return of the strong family unit was a decline in the workweek to 25 hours. With the 25-hour workweek, parents have more time for their children; and many parents work at home, using VideoCam, so they are not far from their children even when they are at work. Parents and children have more time together, for participation in the child's activities, or activities undertaken by all the members of the family. Parents and children often pursue knowledge together, competing on their armstrap compu-phones to see who can get the answer first. There are still problems, to be sure, but fewer of them seem to stem from lack of attention by parents.

Thus, as the educational system focused more and more on human relations skills and the workweek declined, the family began to make a comeback. By 2020 the nuclear family was once again strong, and has in the last thirty years continued to grow toward the extended family of centuries before. The nuclear family now shares more of its life with grandparents, aunts, uncles, and cousins. Children, growing up in an environment of successful marriages and happy extended families, have the images and the skills needed to continue the success in their own generation.

With more time at their disposal, and with less time devoted to "merely making a living," more and more people have taken

an interest in philosophy and religion. In the last three decades there has been such an upsurge of interest in religion that some writers have coined this century the “Age of Religious Rebirth.” When human beings no longer need to spend all their time and effort acquiring the necessities of life, there is time to ask about the meaning of life, and to seek the Divine Spirit. All world religions have experienced a renaissance. Many homes have meditation chapels, and thousands “attend” daily worship services by VideoCam. Churches are thriving, and theological information networks like ChristCall, IslamInfo, and BuddhaFact are extremely popular.

Perhaps the biggest social issue at the end of the last century was housing. There was not enough housing to go around, and what was available, was becoming too expensive for the average citizen to afford. At first, the ideal was a single-family, detached house with its own yard. Later, many people were satisfied with apartments. Still later, people bought small modules suitable only for sleeping and hygienic functions. The typical module today has one bed per person, a sink, a shower, and a toilet. It is inexpensive, and takes up little space. It can be moved, and located in different architectural frames constructed for that purpose. Modules are sold in different sizes to match the size of families or groups, but they are still small and simple, and provide only the bare necessities.

Now, a wide range of housing is available, reflecting the comparative preferences of the individual or family. Some are willing to spend most of their income on a single-family house, especially if they choose to work at home. Others will buy a module and use the money they save on housing to travel or gain new experience. Some will start as a couple in a module, and rent a house while raising their children, and then return to a module after the children have left home. People living in modules who accumulate extensive personal belongings keep them in storage centers.

The significant increase in the use of modules has had great impact on public sector services. As more people began to live in small private spaces, public spaces had to become larger. Greater emphasis has been placed on facilities open to the public— offices, stores, restaurants, fitness centers, playgrounds, parks, beaches, meeting halls, civic centers, theaters, and so forth. People do not “live” in their modular units during the day— they “live” in public. They eat, transmit and receive communications, meet friends and family members, and undertake activities outside their private modules.

All of these public facilities thus receive high use. This is more efficient than single-family dwellings, because more people use the space and materials. The result is that less space and materials are required to meet the needs of each person.

Throughout these changes in dwelling units, the focus has been on the provision of a “psychological home.” The psychological home is a place of refuge, a place to be refreshed, a place of love and friendship, a place of acceptance. It can be an old-fashioned single-family house, or an apartment, or a module; a favorite place in a park, or at the beach; a favorite bar or restaurant; the office where one works; or the place where one worships. Today, we consider a home to be any place in public or private that makes us feel “at home” and therefore at peace with ourselves and others.

Managing one’s daily life is now easier than it was 75 years ago. For example, you may find it amusing that the average adult male of the late 20th century spent an average of 75 hours per year shaving the hair on his face. Pathetic, rather than amusing, is the fact that many of those men managed to regularly cut or burn their faces in the process. Today, of course, some of us have beards and spend as much time trimming them as our ancestors did cutting them. However, according to the last survey, 91 percent of all adult males have

undergone Follicle Fix, and have not had a hair on their faces since.

The discontinuance of the use of money, checks, and credit cards was an important breakthrough. It is hard to imagine, but 75 years ago people carried around pieces of paper and metal and plastic which they used to buy things. The problem was that these pieces of paper and metal and plastic could be lost, and they could also be stolen— in fact, many people were robbed, mugged, and even murdered for them.

Now, with our Unit Transfer System, this simply cannot happen. Each of us has a Unit Transfer Account at the financial institution of our choice, where all our income is deposited and all our debts are paid. When making a purchase, we only need to establish our identity by placing our hand on the Handprint Reader and speaking into the VoicePrint Confirmer. Since no two handprints or voiceprints are alike, fraud is impossible. Also, every vendor receives payment instantaneously, since the transaction is not completed until the Code Key indicates that the required value units have been transferred from the customer's Unit Transfer Account to the vendor's Unit Transfer Account. Finally, nobody loses any value units by accident, nor can they be stolen. This has considerably reduced the crime rate.

There are other ways in which the old money system was much too cumbersome. People kept running out of the paper and metal and checks, and had to go to a bank to get more. This seems to have been the cause of social embarrassment, even among those who were wealthy but did not happen to be carrying any money. Today when shopping, one does not carry money— the charges are made electronically to one's Unit Transfer Account. If there are enough units in one's account to cover the transaction, the sale proceeds; if not, the sale is declined. All income is automatically placed in the same account. Current balances are available at any time, day or

night, by compu-phone with VoicePrint Confirmer.

According to historians, the average resident of Hawaii 75 years ago spent five hours per month just paying bills. These “bills” were requests for payment. Most people spent hours tediously writing checks to pay these bills, then balancing their checkbook account with monthly bank statements. Paying bills was a nuisance. Now, all purchases authorized by Handprint Reader and VoicePrint Confirmer are paid instantaneously through the national Unit Transfer System. There are no bills to pay.

The development of domestic robots has also had a great impact on daily life. Robots come in all sizes and shapes, for a vast variety of purposes, many of them custom-tailored to individual personal needs. Over the years, home appliances became more and more computerized, and took over more and more daily chores. The Foodprep Center, introduced in 1994, was a combination stove, oven, micro-wave oven, slicer, mixer, refrigerator and freezer which could prepare and serve a variety of gastronomic delights from *Mai Tai*'s and steaks to *muesli* and yogurt. The Foodprep Center merely needed to be supplied with the basic ingredients.

By 2002, the basic ingredients were being ordered by computer, and delivered by vendors. Thus, a person could get up in the morning, place the food order for the day— the full menu for each meal, and how many to be served— and the Foodprep Center computer would analyze its inventories, and order what was needed to prepare the required dishes. By 2010, the basic ingredients were not delivered by vendors, but by robot vehicles owned by grocery stores.

Meanwhile, the Clothing Care Center was introduced in 2005. This was a combination of clothes washer and dryer which could also iron, fold, and sort clothes for use. Clothes placed in the “in basket” were scanned by computer vision for

color, type, and nature of fabric. The computer then decided water temperature and type of soap. If a computer vision scan after washing revealed troublesome dirt spots which have not come out, the article was washed again, with more soap applied to the troublesome spots. Clothes were then dried, and placed on molds for ironing. The ironing was accomplished by hot air applied under pressure to the clothing on the mold. Folding was the final step. With the increased acceptability of the bodysuit over the past 30 years, more and more people wear fewer and fewer different items of clothing. As a result, the Clothing Care Center has been simplified and reduced in size.

By 2019, mobile robots were introduced which could operate the Foodprep Center and Clothing Care Center. Approximately human in appearance, these robots were personal valets, and could be given complicated instructions for running a household. This type of robot is still rather rare in Hawaii, and is found mostly in single-family houses where there is sufficient advantage in their use. Most of us use our computers to manage our Foodprep Centers and Clothing Care Centers.

As the number of robots has increased, public concern over their operation and behavior has also increased. Manufacturers have now been required by law to program computers so that they will obey Asimov's Three Laws of Robotics:

1. A robot may not injure a human being or, through inaction, allow a human being to come to harm.
2. A robot must obey the orders given to it by human beings except where such orders would conflict with the First Law.
3. A robot must protect its own existence, as long as such protection does not conflict with the First or Second Law.

The Three Laws do not operate perfectly. For example, in

attempting to fulfill the First Law, it may be hard for the robot to determine what inaction could result in harm to a human being. When all conceivable courses of action would result in harm, robots have difficulty judging which harm may be greater than another. As for the Second Law, if two human beings give conflicting orders, the robot may be stymied. These are among the many problems being pursued by the robot manufacturers. The small number of mobile robots and their current limited use has kept the problem within manageable bounds.

It has also become more common for people to have artificial organs and limbs. These were first introduced to save lives— artificial hearts, and lungs, and kidneys— or to replace lost arms or legs. Later, elders of the community purchased artificial organs to prolong life. A few people have purchased artificial arms and legs for greater physical strength.

The desire for physical strength, however, took a new turn with the invention of the bodyframe. Bodyframes look like a human skeleton, with the same basic limbs and joints. They are custom-made to match each individual's body, and they are usually made of molybdenum alloys and plastic. First introduced in 2007, they carry a powerpack equivalent to 10 horsepower. A person steps into his bodyframe, straps it on, and beings climbing or lifting or whatever heavy work needs to be done. The bodyframe is programmed to follow every bodily movement— with strength.

Personal safety seems much greater today than 75 years ago. While guns and rifles are still manufactured, they are manufactured with an alloy which is easy to detect on Z-Ray Scanners. Anyone can buy a Z-Ray Scanner; they are used mostly by police. Small hand-held scanners can detect a gun or rifle within a 200-yard radius; large scanners mounted on police hovercraft can detect a gun or rifle within a mile. An underground industry has emerged— the manufacture of illegal gun boxes

and rifle carrying cases which cannot be penetrated by the Z-Scanner. The box or carrying case itself can be detected, however, so the scanner is still valuable. Of course, the scanners work against police weapons as well as those of criminals. The overall result has been less use of weapons and fewer deaths.

A controversial use of Z-Scanners has been the detection of prisoners. It was proposed 40 years ago that a metal alloy strip should be implanted in the skull of each dangerous criminal, so that Z-Scanners could track him or her at all times. After five years of debate on constitutional and moral issues, surgical procedures were proposed which were deemed painless and harmless. The goal, it was pointed out, was to protect society from those who had defied its laws. Today, Z-Scanners track the most dangerous criminals while in prison, and if a criminal crosses the Z-line in an attempt to escape, alarms go off, with the Z-Scanner showing the prisoner's current location. Large Z-Scanners mounted on police hovercraft can detect a prisoner who has escaped. This has done much to keep prisoners in prison, and increase the sense of safety in the community at large.

It was inevitable that Z-Scan technology would soon have wider commercial applications. By 2023, many people had purchased "Find-It," "Ne'er Be Gone," or "Gotcha," the three most popular home tracking systems for people who commonly lose things. Each kit comes with a hand-held Z-Scanner, plus 100 alloy strips which can be attached to objects which are easy to lose or are too important to lose— major tools, important documents, and jewelry. Fewer people now spend time looking for things.

Finally, some manufacturers have produced VideoCam equipment, hovercraft, and compu-phones with a built-in alloy identifier which makes each piece of equipment unique under X-ray analysis. If stolen, these items can be positively identified and returned to their rightful owners.

All in all, daily life today is more satisfying and more fun than 75 years ago. We are richer in human relations, especially in family life. There are fewer chores, and we are generally safer. We have more time to spend with those we love, and to pursue our special interests, including philosophy and religion. Our brothers and sisters are all fed and clothed, and there are many opportunities to serve the community through formal work and volunteer contributions. We are more productive— and we have more peace of mind.

LECTURE 9:

LOOKING AHEAD TO THE YEAR 2100

Distinguished guests and friends, this is my ninth and final lecture. It seems only appropriate to reflect on the trends of the past, and then raise some concerns about the future.

I want to begin with a bold assertion, which is this: I believe our society is more sensible and more moral than society 75 years ago. Certainly, it is difficult to defend such a statement, in light of the variety of values and views on morality, and the changes in accepted morality over the years. But I make the statement nonetheless, and let me tell you why.

First of all, we have greatly reduced the likelihood of war, and have dismantled the means of nuclear devastation. We still have the knowledge required to build and use nuclear weapons, and that knowledge means that there is still a danger. But there are no longer 50,000 nuclear warheads deployed around the world, ready to respond to the push of a button. We have stepped back from the brink. We have made the moral and political decision to protect life, and create a greater distance between us and the potential for total destruction.

This achievement is reinforced by the strong trend toward world government. Looking back over the centuries, it must have been thought at one point that a series of principalities and free cities could never form a united Germany; or the colonies of America could never form a strong United States; or the distant cultures of Russia and Siberia could never form a strong Soviet Union. Certainly the process of unification is a long one, but the sweep of history is behind it. Increased communication, travel, and trade have helped; increased inter-marriage has helped; the growth of the Federated United Nations has helped. When world government arrives, it will not extinguish conflict,

but it will end war; it will not extinguish our differences, but it will allow us to enjoy them. While building one world, we will retain the richness of life which comes from our different languages, cultures, and customs.

Second, we are now more in tune with nature and the life cycle of our planet. Our energy is no longer finite fossil fuel, but the infinite renewable energy of the sun, the ocean, and—soon— the fusion of atoms. We are no longer polluting the earth with fossil fuels burned by electric plants or consumed by automobiles. We have changed back to natural products, where feasible, so that they can be broken down organically, and become part of the natural process again. We are using nutrition— the body's own systems and defenses— for longer life, and better health.

In short, rather than fighting and damaging our external and internal environment, we are joining together with it and are in harmony with it. We may differ in our views on a Creator, but I have no doubt about Divine Creation, and to be in tune with that Divine gift is to have achieved a new level of sensibility and morality.

Third, we are now more in tune with each other, and the cultures of the Planet. A dying man in a faraway country is no longer just that country's business; it is everybody's business. We have now managed to feed, clothe, and shelter all human beings. We have made good on the age-old desire to make all men and women our brothers and sisters. We are not all the same; we are not equal in resources; we have not solved all our problems. But we are no longer standing around watching the poor die of starvation, disease, and over-exposure to the elements. We now have a claim to being moral human beings.

We are also, I believe, using more of our talents and our potential, and as a result, we are having more fun. Creativity and imagination, speculation and innovation, are a larger part of our

lives than the lives of our ancestors only 75 years ago. So many barriers to creativity have fallen. For example, we now have inexpensive and instantaneous access to nearly all the information which is publicly available anywhere in the world.

We have, I believe, also re-established a sense of community and the human scale. Our cluster neighborhoods and floating cities have reduced community size so we know our neighbors, and we walk familiar streets. We live among buildings which are several stories high, not 20 or 30 stories— too high to feel comfortable.

We are more democratic in a number of ways. With our compu-phones, we vote more often on more issues. They have not all been binding votes, of course, but they have stimulated greater interest in public affairs, and have been a better reflection of public opinion than the opinion polls of the last century, which sampled a perilously small part of the population. The polling of all community members on current issues, which takes place each Monday by compu-phone, has kept our political leaders closer to the mood and desires of the people. Remember that 75 years ago our ancestor voted only once every two or four years, and then the vote was on individuals, and rarely on issues.

We are also more democratic in a deeper way, a way which relates to equality, equal opportunity, and equal access to facilities. It is not only the rich who have access to beautiful parks and beaches, recreational facilities, and meeting halls. The quality of our public parks and facilities is high, and that means that all people, regardless of economic means, have a minimum standard of living and enjoyment which, in the last century, was only enjoyed by the wealthy few.

Certainly, we have not solved all the problems of life, and we have much to learn about social relations between individuals, within families and groups, and throughout society at large. We

have not eliminated crime, especially crimes of passion and competition, which seem to have a primordial basis in our instincts to fight and conquer, to become enraged and violent when threatened or unhappy. But all in all, great progress has been made.

We have grown and changed over the last 75 years. And yet, the Hawaii of today would be understandable to our grandparents. We have added ocean space and outer space to our daily lives. We are far more entrepreneurial in our industries; and our public goods are enjoyed by far more members of our public. Our industries and our daily lives are more heavily focused on experience and psychological satisfaction. We benefit from a liberated educational system, and we have greatly improved our skills in living with each other. Our economy is strong, and we have increased the natural beauty of our islands.

Looking forward, we have new problems, some large and some small. For example, we have been having trouble with spacehouses. For decades, people have been living in modular, self-contained housing units, complete with energy and plumbing and food recycling systems. We have hundreds of simple frame structures which support such modules. Recently, however, these units have been manufactured with wings and jet engines, for vertical take-off and landing. People are now flying all over the world, setting down on any surface that suits their fancy. We have tried to accommodate this trend by setting up spacehouse parks, with individual landing slabs and stall numbers. Landing is by permission only, but many of our visitors are not obtaining permission. Last week, one landed unknowingly on the judiciary building, and was duly arrested. However, hundreds have been ignoring our regulations.

Concern has been expressed that our space launching business is threatened by new technology. It is true that planning has begun on the space elevator, first proposed in the

1960's by Soviet engineer, Yuri Artsutanov, and popularized in the 1970's by the writer Arthur C. Clarke. It appears that a space elevator would make rocket launching obsolete. Perhaps by the year 2100 there will be an orbiting band around the equator, like one continuous space station, with cables reaching down to Earth. If so, we will be able to ride up and down on those cables in spacecars powered by electricity. This would certainly be much cheaper than rocket fuel. It has been predicted that millions of people per year would use such a system.

This is of obvious concern, since the space launching industry is now a large industry. However, the demise of rocket launching has been predicted before, and I say we shouldn't panic. Instead, we should lobby heavily in Washington and at the United Nations so that one of the space elevators will be located at Ka'u on the Island of Hawaii. The supporting infrastructure and supply systems are already there.

There is also concern that our marvelous observatories on Mauna Kea and Haleakala will soon be put out of business by the major telescopes being planned for the Moon. It is obvious that telescopes on the Moon will be far superior, because the atmosphere of the Moon is a vacuum and there is no atmospheric distortion such as we have on Earth.

However, I am not in the least bit worried about our observatories. They were not put out of business by the orbiting space telescope which began operating 20 years ago, and they will not be put out of business by telescopes on the Moon. There are 100 billion other suns in our galaxy, and there are probably 100 billion other galaxies with their own suns. To put it simply, there is a great deal to look at. The more telescopes the merrier! Those in space and on the Moon can study planets; ours could be more fully devoted to the search for extra-terrestrial life.

The discovery of extra-terrestrial life is a distinct possibility. Astronomers have debated for centuries whether there is life on Mars. A long series of space probes, beginning in the late 20th century, were inconclusive. Our first manned mission to Mars, a joint mission of the United States and the Soviet Union, landed in 2018 and gathered extremely provocative information. That stimulated the second mission, the famous “Lost Mission,” which landed in 2036 and immediately disappeared, never to be heard from again. Subsequent space probes have not found a trace. What happened to it? Is there life on Mars? Did the Martians simply watch our first mission, gathering information about our capabilities, and then take decisive action against our second one? Should we send a manned mission again?

There are other questions to answer. For example, I would like to know just exactly what is happening at SS 433, a star in the constellation Aquila. SS 433 is ejecting in opposite directions two narrow jets of gas at a speed hundreds of times faster than anything else in our galaxy. The energy required to power these jets is estimated to be a million times the output of our own sun. Are these jets natural, or artificial? If they are artificial, what is the nature of the alien intelligence which created them? And most important, why is SS 433 moving in our direction?

The thought of extra-terrestrial intelligence merely casts in stronger light the issues we have already begun to struggle with among ourselves here on our home planet. All life on Earth is related ecologically, and also in basic building blocks— the cell, and DNA, and RNA; bacteria and viruses; the conversion of food and energy. While we think of human beings as totally different from plants and animals, we are not— to an alien life form, all the life forms on Earth would appear to be close relatives.

And some of our close relatives are talking to us. Once we address the general question of intelligence and the ability to communicate, there is the question of the proper integration of

whales and dolphins and chimpanzees into our society and our body politic. Blue Peace is now organizing a campaign in favor of citizenship rights for whales, dolphins, and chimpanzees. Should they have the vote? Dolphins and chimps have already been trained to pass the basic intelligence tests; several dolphins and chimps can now pass the tests required for naturalization as a citizen of the United States. We talk to them, and they talk back, and we make sense to each other. Can we deny them the vote? Is it enough to say they aren't human? How can that be the final answer?

The rise of robots further provokes these questions. Robots have become more and more like human beings in appearance and in functional competence. Today, the voice tones and quality of thought of computers and robots are so "natural" that few of us can tell if an interaction over a compu-phone is with a computer or a human. And the trends seem to converge: robots are looking and acting more like human beings, and humans with artificial organs and limbs are looking and acting more like robots. Is the only real distinction the fact that a human brain is made of living cells and the robot brain is made of silicon and metal? And where does this lead? Humans die, but robots live indefinitely. Will they take over? Are human beings just a convenient means for robots to reproduce themselves?

It is no wonder that we spend much time asking ourselves: What is a human being? How do we relate to other life forms? How do we relate to machines? What are the limits to human nature? How limited is our ability to adjust, to grow, to seek and seize new lifestyles, new institutional relationships? Can we rise to meet new challenges? How immutable are our genes?

With health and medical advances, the "survival of the fittest" has long ceased to determine the make-up of our genetic pool. Is our genetic pool therefore degenerating? As population declines in the coming centuries, the human gene pool will shrink. Will this limit our adaptability?

As we brood over these questions, there is the larger context— the universe, with its impossible distances and hundreds of billions of galaxies. Is there life out there? We have been monitoring the skies for nearly a century, with many false alarms, and many intriguing possibilities, but no answers. Are we alone— and if so, what does that imply? If we are not alone, what does that imply? What are immortality and eternity in the context of an unlimited universe? What are immortality and eternity in a universe which may fade into nothing?

And so, as we have become more in tune with our own planet and people, we face the next steps, the challenge of becoming in tune with the universe, its resources, and— perhaps— its inhabitants. It is too large. It is overwhelming. And yet, we must go forward, to learn, to explore, to pursue the nature of our being and the environment around us— our world, and then, all worlds.

ABOUT THE AUTHOR (1987)

Kent M. Keith graduated as student body president of Roosevelt High School in Honolulu in 1966. He studied government at Harvard University, receiving his B.A. with honors in 1970. The winner of a Rhodes Scholarship, he traveled to Oxford University, England, where he studied philosophy and politics for two years at Oriel College, earning his Master's degree. The Rhodes Trust granted him a further scholarship to study in Japan, where he lived for two years, studying Japanese at the Waseda University Institute of Language Teaching and the Tokyo Japanese Language Center.

Returning to Hawaii in 1974, he entered the University of Hawaii School of Law. He received his J.D. and became a member of the Hawaii bar in 1977. For two years he practiced in the commercial litigation department of Cades Schutte Fleming & Wright in Honolulu.

From September 1979 through December 1986, Mr. Keith served in the State of Hawaii Department of Planning and Economic Development. For two years he was a Coordinator in the Office of the Director, responsible for the ocean thermal energy conversion and manganese nodule programs. In August 1981 he was appointed Deputy Director, and in April 1983 he became Director of the Department. In that role he headed the State's economic development efforts, and served as State Planning Director, State Energy Resources Coordinator, Chairman of the State Policy Council, and member of numerous boards and commissions.

In December 1986, Mr. Keith joined Oceanic Properties, Inc., the land development subsidiary of Castle & Cooke, Inc. He is the Project Manager for the Mililani Technology Park, a 256-acre development in Central Oahu.

In January 1984, Mr. Keith was honored by the United States Jaycees as one of the Ten Outstanding Young Men of America. He was the first person from Hawaii to win this honor since Senator Daniel K. Inouye won in 1959.

Mr. Keith has published many papers and articles on ocean law, energy, planning, and economic development. His books include *Jobs for Hawaii's People: Fundamental Issues in Economic Development* (1985). He is an active member of the Chamber of Commerce of Hawaii, the Social Science Association, and the Hawaii Loa College Board of Trustees. He is married to Elizabeth Misao Keith, and they make their home in Manoa.

ABOUT THE AUTHOR (2020)

Kent Keith was born in New York and raised in Nebraska, California, Virginia, and Rhode Island before arriving in Hawaii in 1962 at the age of fourteen. He attended Stevenson Intermediate School and Roosevelt High School in Honolulu, graduating as student body president of Roosevelt in 1966. He earned a B.A. from Harvard University, an M.A. from Oxford University in England, a Certificate in Japanese from Waseda University in Tokyo, a J.D. from the University of Hawaii, and an Ed.D. in higher education leadership from the University of Southern California. He is a Rhodes Scholar.

During his career, Dr. Keith has served as an attorney for Cades Schutte Fleming & Wright; State of Hawaii Director of Planning and Economic Development; Manager of the Mililani Technology Park; Senior Vice President of the YMCA of Honolulu; and President of Chaminade University of Honolulu. In 2007 he moved to Indiana to serve as CEO of the Greenleaf Center for Servant Leadership (USA), and in 2012 he moved to Singapore, where he served for three years as CEO of the Greenleaf Centre for Servant Leadership (Asia). From 2015 to 2020 he served as President of Pacific Rim Christian University in Honolulu.

Dr. Keith has given more than a thousand speeches and workshops in the U.S. and thirteen countries in Europe, Asia, and Africa. He was featured on the front page of *The New York Times* and in *People* magazine, *The Washington Post*, and *The San Francisco Chronicle*. He has appeared on dozens of TV shows and more than 100 radio programs in the U.S., U.K., Japan, Korea, Kenya, and Australia.

Dr. Keith is known throughout the world as the author of the *Paradoxical Commandments*, which he first published in 1968 in a book for student leaders. In 2002, his book *Anyway: The Paradoxical Commandments* became a national bestseller in

the United States and was translated into 17 languages. He is a passionate advocate of servant leadership and has written a number of books on the topic, including *The Case for Servant Leadership* and *Servant Leadership in the Boardroom*. More than 250,000 copies of his ten books have been sold worldwide.

Dr. Keith is married to Dr. Elizabeth Misao Keith, who teaches Japanese Literature at the University of Hawaii at Manoa. Kent and Elizabeth have been married for 44 years and have three grown children. Officially retired from full-time work, they continue to teach, speak, and write on a variety of topics. More information about Drs. Kent and Elizabeth Keith is available at www.carlsonkeith.com.



HAWAII:
LOOKING BACK
FROM THE YEAR
2050

THE EDWARD BELLAMY
MEMORIAL LECTURES

KENT M. KEITH