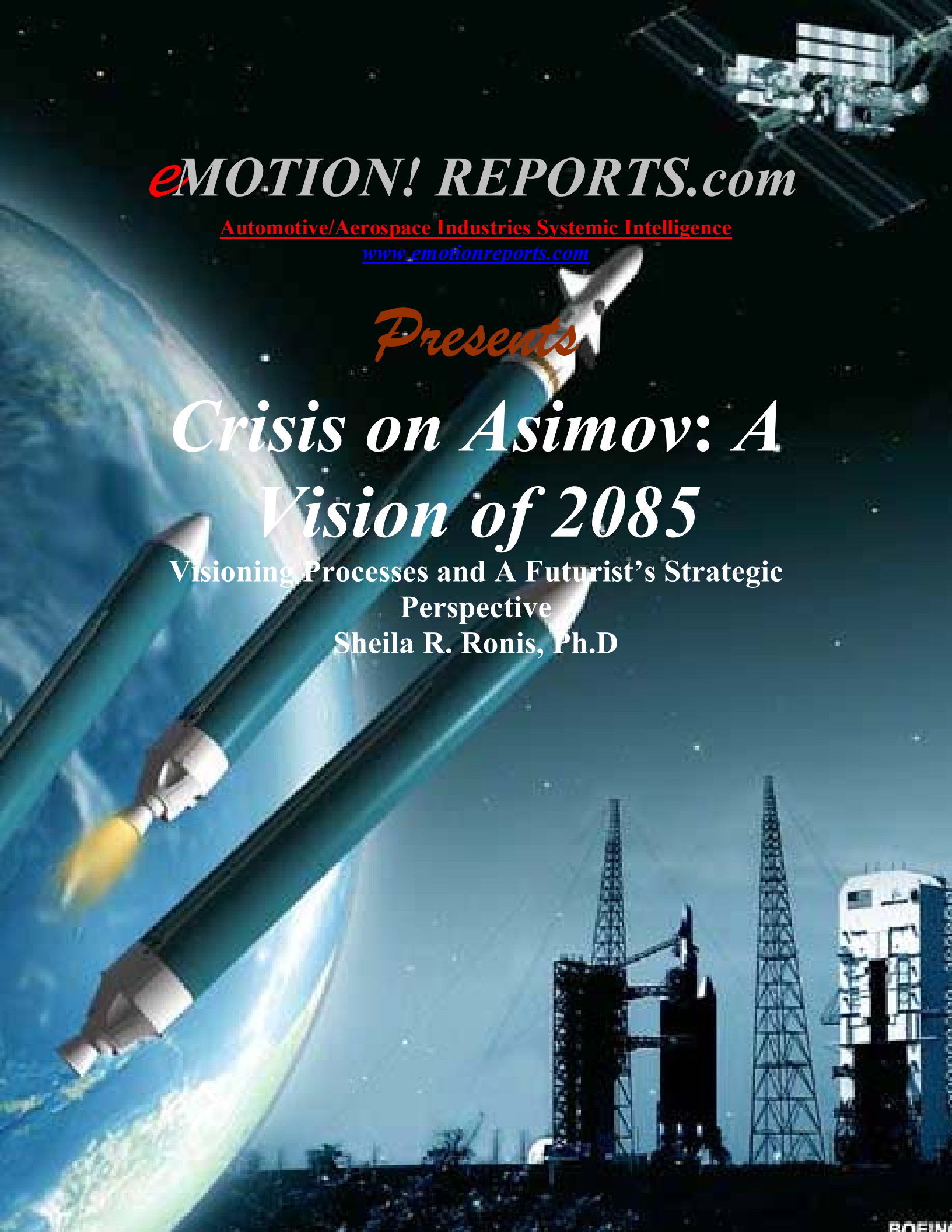

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Presents

Crisis on Asimov: A Vision of 2085

Visioning Processes and A Futurist's Strategic Perspective

Sheila R. Ronis, Ph.D

Crisis On Asimov: A Vision of 2085

Visioning Processes and a Futurist's Perspective

From the Author

Colleagues:

There are many processes that constitute "visioning for the future." This "dramalysis" describes the output of a visioning process that developed a scenario or story. I've called it Crisis on Asimov and it is about the future of the transportation industry. Automotive Industries Magazine published a part of my scenario here in the United States and the Financial Times Automotive World published a part of it in London. The scenario was developed using a U.S. Department of Defense visioning process which I had the privilege of working on and helping to further develop. This particular visioning process, or the series of techniques that created Asimov, tests assumptions. Visioning can be used as an important tool in any organization's planning cycle.

I'm pleased and honored to announce that a book which expands on the visioning process, "Crisis On Asimov: Strategic Visioning Processes for Government, Industry and Education", will be published by the University Press of America in January 2005.

Also, considering Boeing's powerful role in the future depicted in Asimov, eMOTION! REPORTS.com Publisher Myron D. Stokes felt that it was appropriate to utilize artist's renderings of a new Space Shuttle proposed by the company that has moved beyond the conceptual stages.

Lastly, I'd like to congratulate all those visionary people involved in the June, 2004, launch of the new Science Fiction Museum and Hall of Fame (SFM|HOF) in Seattle, which I feel will contribute much to a return by the

general public to the fascination associated with the 1960's "space race". This time, however, we have set our sights on Mars and beyond.

"Asimov" is dedicated to the brave pioneers of Challenger and Columbia, and all those who went before them and will follow in the pursuit of – to quote my august colleague and mentor Dr. W. Edwards Deming – "profound knowledge."

I believe that the following overview of the visioning process and an execution of that process as expressed in "Asimov", will act as prelude and primer for a work we hope will be welcomed by educators, government and industry executives alike.

***Sheila R. Ronis**, Ph.D*

Synopsis

"There are an infinite number of potential futures, so a vision of the future is not a forecast or a prediction but a planning tool to think about events that could happen in the future before they occur."

There are an infinite number of potential futures, so a vision of the future is not a forecast or a prediction but a planning tool to think about events that could happen in the future before they occur.

A vision is actually a description of a future state and the role an organization will play in that future. For that reason, the future state needs to be, what I call, a 360 degree look at life in a particular time frame. One of the easiest ways to do that is to create a family in the future and explore their life. That way, you usually can see what role your product or service will play in their lives. It is a first hand view of the future, and you can watch and learn. In *Asimov*, it is the role of Benson Chadwick, his wife, Yoshiko, and their two children, Peter and Anna that are fully explored with regard to everything. We not only look at transportation, but also medicine, manufacturing, education, telecommunications, business, leisure, food, politics, and the values of the time.

Visioning is part of a strategic management process. Done correctly, visioning is a disciplined series of steps that helps organizations answer the questions they need to ask themselves in order to be prepared for the future. If an organization cannot answer these questions, it is unlikely that the organization is prepared for the future.

Although I have been involved in visioning and strategic management processes for years, in my work with the Department of Defense, I learned some new techniques about how visioning can help an organization to more effectively be prepared for whatever the future brings…

There are really three major categories of visioning processes that

organizations can find useful. Most visioning processes are combinations of one or more of them.

One of these processes leads to the publishing of a "vision" statement for a company or organization... you know the kinds of statements we all read in a organization's annual report that talks about what they want to become in the next several years... like "the leader in transportation products and services..." to borrow an example from General Motors. These statements should be used to help communicate where the organization is going to its key stakeholders; its employees, suppliers, unions, constituents, stockholders and so on.

Incorporation of Visioning Processes in Organizational Systems

Another version of this process can be used to build a consensus with key stakeholders by producing a *shared vision of the organization.* This provides a process that enables stakeholder "buy in." It also helps make the vision a reality especially in large complex industries such as governmental units, where whole organizational systems come together to create the ultimate product or service for the customer. But, it is also a technique that can enable learning by the senior leadership together, as a team.

The third set of visioning processes produce scenarios, like *Asimov*, and can help an organization to think through alternative futures, and their roles in those futures.

Visioning is a planning tool to learn and think about events that could happen in the future before they occur.

There are many different kinds of visioning processes and they lead to many different kinds of results, depending on what you need from the process. Some organizations actually do look out twenty years or more to try and see the diversity of contingencies they have to be prepared for. Some people use scenario planning as a tool to gain consensus or "get to yes," especially to talk about where their organization should go and what the organization should stand for. Some companies use the process to determine what their beliefs and values are and what they should become in the future if different from the present.

Knowing versus Learning

Every organization in industry should be engaged in this kind of thinking with his leadership team.

My friends at the Pentagon say that the really important part of visioning is the process of opening our eyes and minds to things we ordinarily wouldn't consider... literally, to "think the unthinkable." It is the ultimate learning and planning tool.

With all the work trying to design and implement "learning organizations," in the Peter Senge MIT sense, the truth is that many organizations' cultures do not value learning or the knowledge it brings. Most of these organizations have not developed processes to share and use new knowledge acquired. Visioning can assist in this process, but only if senior leadership is willing to learn and use that knowledge. This requires an attitude that there is a need for new knowledge; that, we don't have all the answers. And, sometimes, that's very difficult for executives to accept. It's what Senge's group calls getting out of *"knowing"* and into *"learning."*

This is exactly where the Pentagon was right after World War II, when America believed it knew all the answers and before we lost our first war in Korea, and then, a second, in Vietnam.

Thinking the Unthinkable

The processes I began to work with evolved out of the end of World War II, when Congress asked scientists at The Rand Corporation in California to help sort through the myriad issues surrounding nuclear warfare. They developed a process to force decision makers, who were in denial, into "thinking the unthinkable" -- what would really happen if nuclear war became a reality? This thinking ultimately led to the understanding that nuclear war and "mutually assured destruction" was insane...it meant nuclear annihilation, and there could be no winners in a nuclear war…an important lesson to learn.

Concurrent to the development of the Rand Corporation process in the late forties and early fifties, the concept of general systems theory was also

emerging. In this work, scientists began to view the world differently-- not just using the tools of analysis, but also of synthesis, which put the pieces of a system together in order to understand the whole. This created a new way of looking at the world using a discipline called integration, which puts pieces together to understand how their fit makes the "whole" work. Ultimately, this discipline evolved into systems thinking and systems science

Systems Theory

At the same time as the development of these theories, there was an increasing awareness that general systems theory applied to all natural systems; physical, biological, ecological, economic, even social, financial and organizational.

Visioning processes are excellent ways for senior leaders to learn the peculiarities of the social system they are managing. It is a good way to understand the underlying concepts of systems, too.

We know that all formal social systems, are essentially living; without people, they are nothing but concrete, paper, intellectual property and digital information. As living systems, they're in a constant process of interaction with their environment and their many stakeholders. At first glance, some very large organizations may seem like systems of forbidding complexity. So, to understand a system, it is crucial to understand its elements and their interactions.

What this means for an organization is that each element of the organization must rely upon and interact with the rest of the organization in order for the organization to work. Problems are best solved, not necessarily by breaking them up into "functional" bites, but by getting into the next larger system and solving them through integrative mechanisms. Visions of the future need to look at the system as it is currently configured, and, then, what it will look like in many different futures.

Looking at the visioning process that created Asimov explains how it was developed.

This process begins by asking individuals to think about the system they want to work on. Once the system is determined, the top three assumptions about that system are written down. When I decided to use this process for the *Automotive Industries* project, I told the process leaders that I had three assumptions about the automobile industry that I felt were generally accepted in Detroit. They were:

1. There will always be cars
2. The laws of physics will not change, and
3. There will always be a General Motors.

I think they say a lot about my biases. What I did not quite understand in the beginning was just how much this process tested my assumptions by making me come up with plausible scenarios that negate each one. And, that is an integral part of one of the key techniques for visioning. . .testing assumptions.

As we identify and examine the assumptions about the current system it is gradually defined in its entirety. This includes the external environment, or the forces from the outside on the system; the internal environment; and what is called the stakeholder environment, which includes an understanding of all stakeholders of the system. It is essential that the definition captures the identity of the system as it currently exists, and, then, how it could be in the future.

Critical Analysis of Organizational Infrastructure

The internal environment of an organization is very important to define since it is the heart of the system. Every organization should understand the forces at work inside their system, if they are going to be able to think through these issues in multiple future timeframes. This includes an understanding of the people of the organization and how well they work together, as a team, to accomplish the work of the organization. What business is the organization in? Will it even exist in the future? Will it be obsolete? Is it profitable? Is it competitive? Is the organization structured effectively and efficiently to accomplish work or is the structure a barrier? What are the functions of the organization? How well do they work together? What is the organization's overall process capability? Is it

measurable? What about process integration, that is, how does the process of one function interface with the process of another?

A crucial element of the internal environment is the culture of the organization. How would it be characterized? Is it a positive force for change in the organization or a barrier to change? Are there formal, written statements of beliefs and values? What does the organization stand for?

How are decisions made? What is the resource allocation process? How does the organization invest in its leadership for future generations? What is the infrastructure that supports the entire organization? What are the organization's unique core competencies that separate it from others? Who is the customer? Who will be the customer, tomorrow? Do you know the answers to these questions, today? How will all of these questions be answered in the future?

What will the world look like in the future? And, how will the organization fit in that future? What will make the organization successful in that future? Answering these questions is at the heart of visioning.

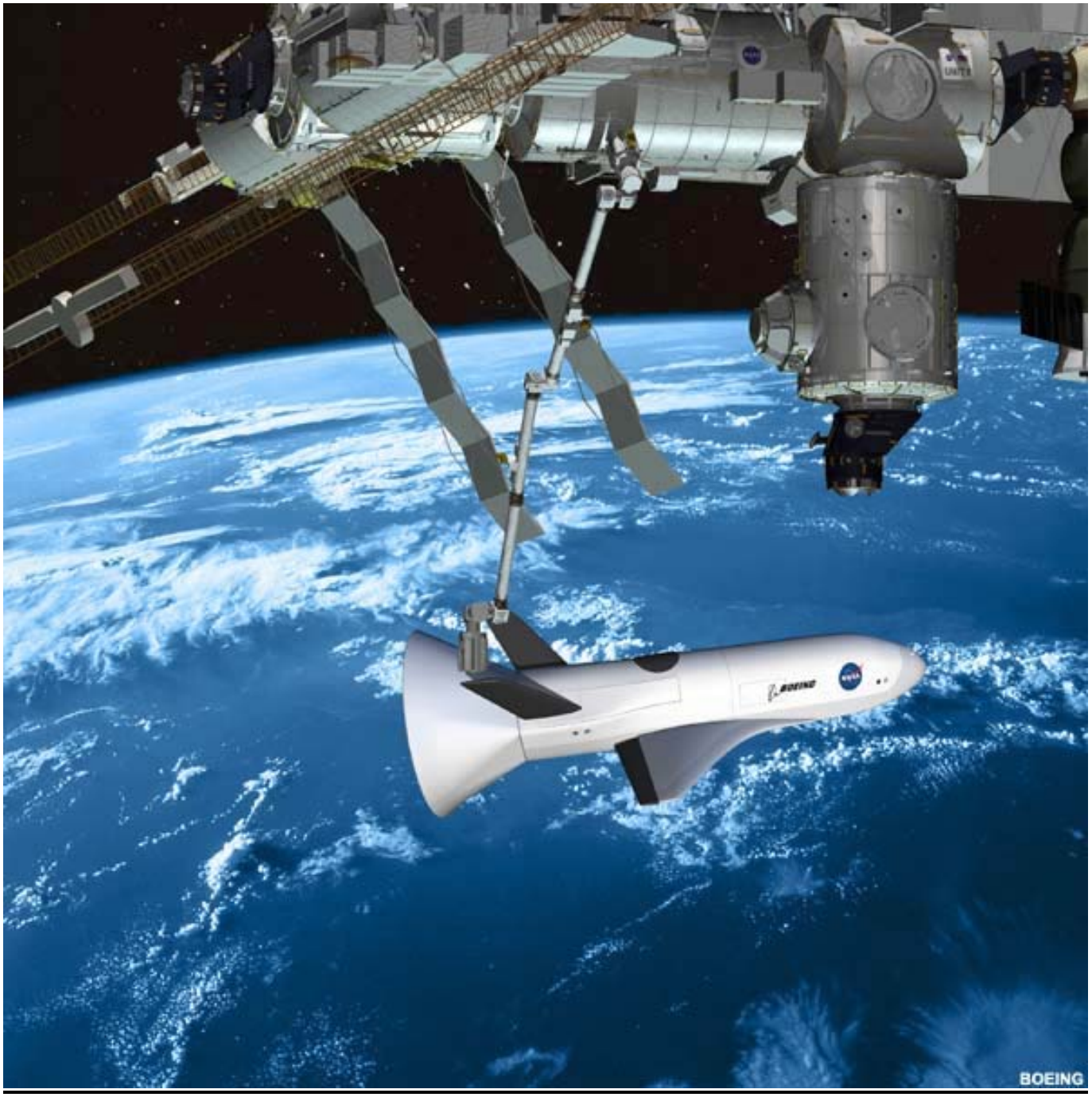
Breaking out of "The Box"

While visioning processes are being developed, it's important to understand how comprehensive one could be. It frequently is helpful to go far into the future, like the *Asimov* scenario, in 2085, to describe a vision, and then come back from the future to a year ten or twenty years hence. This enables the individuals to break out of their thought patterns, think "out of the box" and accept non-traditional ideas. It is also important to think of the historical timeline and to write a future history as the scenario unfolds. What will the world be like in the future?

In the *Asimov* scenario you will see how I tested my three assumptions about the automobile business listed above.

This will show you what a 360-degree look at the future is like, and how extensive the work can be because all of these assumptions are not true in *Crisis on Asimov*.

Remember, this is a *"gedanken"* experiment, in the Einstein "thought" experiment sense – not a forecast or a prediction, but a way to learn and think about the future so you can do something to "shape" it the way you want it to be. Shaping is the way the Pentagon describes the process of influencing events to create the future you want.



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Crisis on Asimov

Introduction

Tucked away in Denso's secret laboratory, Nobel Prize winner Dr. Kiri Tanaka stared in disbelief out her window at the gentle rolling hills on the island of Kyushu, Japan. She'd just confirmed the Biefield Brown effect is real. From now on, the world will never be the same.

The ramifications are mind-boggling. It marks the end of the internal combustion engine as the only way to cost effectively move people and product. If her analysis is correct, when current goes through a wire, the positive pole is lighter than the negative pole and the positive side is lifted into the air. In short, we can fly through the conductivity of electricity, alone.

She ran over the scenario in her mind. She'd been working on Einstein's Unified Field Theory, which looked for the relationships between electricity, magnetism and gravity. She'd just found it.

During a routine search in this area of physics, she came across the work of an obscure physicist from the early part of the last century, Thomas Townsend Brown of Denison University. In the 1920s, he discovered that if placed in free suspension with the poles horizontal, a condenser, when charged, exhibited a forward thrust toward the positive pole. The scientific community, pushed by the powerful electrical companies, that wanted no part of cheap energy, wrote it off as a fluke.

Using powerful simulations, she verified the work in the computer since her models were built with all known theories of physics. She confirmed the computer's calculations by replicating Dr. Brown's work.

Looking at her reflection in the window, she muttered quietly, "Now I know what I'll tell the Denso scientific meeting next month. I also know what the future of my grandchildren will be like."

Crisis on Asimov

Chapter 1

PTVs

Kiri's grandson Benson Chadwick opened one eye. "Good morning Benson. It is July 1, 2085 at 0500, and your PTV (Personal Transportation Vehicle) is programmed to depart at 0600 so you can catch the 0615 shuttle to the Earth. It's time to rise and shine," murmured his alarm clock.

Benson was heading for an IBM senior executive knowledge sharing conference on Earth. His job was to explain to the company elders why PTV consumer preferences are so different on each of the 12 satellite cities orbiting the Earth. He has also been asked to give a psycho-graphic profile of Boris Chin, the chairman of the System Safety and Environmental Council (SSEC).

"The system's largest transportation company is FSB. It was created in 2017 when the boards of the three organizations realized they held the required synergies between them for the future of transportation, based on Biefield-Brown technology"

The SSEC will soon decide what company will win the century's most lucrative PTV contract -- to build drivable PTVs for Asimov, a Disney-Sagan resort. For decades, no one has been allowed to drive a vehicle anywhere in the system because of environmental and safety concerns.

In 2021, money the world over was replaced by electronic "system dollars" and currency disappeared. Now, people use Microsoft debit cards throughout the system to buy everything. In 2019, Microsoft, knowing that the movement of wealth would yield the greatest profits, purchased MasterCard, Visa International and American Express.

That was only one of the major changes in the early part of the 21st century.

IBM, as it is configured in 2085, was created back in 2020 when the merger wave of the old automobile industry took place as globally competitive companies tried to battle Toyota, CIMMCO, the China Integrated Motors and Manufacturing Company, and the huge Ford Sony Boeing Group or FSB.

The system's largest transportation company is FSB. It was created in 2017 when the boards of the three organizations realized they held the required synergies between them for the future of transportation, based on Biefield-Brown technology. Ford executive, Jason Deming, who sat on the Sony board, found out Sony scientists were close to perfecting that technology. With Sony's blessing, Ford scrapped all plans for vehicles with wheels. Instead, it threw all available R&D money toward the development of a global infrastructure and the creation of Personal Transportation Vehicles.

Realizing it couldn't go it alone, Ford approached Sony and Boeing. That merger married Ford's marketing ability, Sony's electronic prowess and Boeing's skill at building lightweight space-frames that integrate sophisticated electronics, such as fly-by-wire and avionics.

During that time, the former automotive industry was becoming the PTV global infrastructure as we know it today, and the need to "space" (a verb) was changing the industry as well. Being a global corporation at that time was considered much too "provincial."

IBM was organized out of what was left of General Motors, Daimler and Volkswagen. After the information wars, these companies knew they could not go it alone and be competitive, so they joined together.

Back in the late 20th century, GM emerged as the dominant automaker in China. It negotiated relationships with every province and every major Chinese manufacturer and supplier so that the Chinese automotive infrastructure and GM became one and the same.

In the late 1990s, Hong Kong was re-annexed to China and Taiwan followed after more than a decade. Those industrial powerhouses were integrated into the old Communist systems of China. By 2007, China, Inc. was created, modeled loosely after Japan's MITI system. Ten years later, China

had become a global powerhouse. Its transportation arm was called CIMMCO. It soon became a haven for organized crime.

For millennia there had been a profoundly evil ancient Chinese influence which manifested itself as the "Triads." It wove its way into CIMMCO when the organized crime family in Guangdong province requested a percentage of the organization in exchange for the protection of its employees throughout the province.

CIMMCO obliged.

Seeing an opportunity to hike the stock price, the family decided to destroy GM. If CIMMCO's leadership would have uncovered the family's plan it would have taken steps to prevent it. But the stealth capabilities of the Triads were so superb that there was no warning. The Triads proceeded undetected.

Using the best information warfare techniques of the day, they were capable of delivering viruses into the heart of every major computer system that ran their giant nemesis, General Motors. One knocked out the global design network when five suppliers making parts of the interior for GM unwittingly introduced the viruses into the system. The Triads planted parts of the virus in each supplier's system. When GM linked each program, the system crashed.

A second virus took out the database system that linked accounts payable and the supply community.

For all intents and purposes, GM was dead. So were several other companies.

Prior to the information wars, GM had linked its computer system with other automakers to keep several joint ventures running smoothly. When GM's systems went down so did those at VW and Daimler.

Desperate to save the elements that GM represented in the U.S. industrial base, the government stepped in. A small Pentagon brain-trust, seeing the potential for PTVs, encouraged IBM to buy GM's remaining assets and sink

money into that technology. IBM decided to create a global empire by buying what was left of GM's other partners for rock bottom prices. It was 2020.

What made it all work was the ability to tap into something called the Quality Network process, GMs historic quality process with the United Auto Workers where union and management worked together to solve problems. The Quality Network became *the* process that enabled IBM to manage the new global business. It was perfect to merge the cultures of the three companies, solving problems along the way.

Although it surprised many people, the Quality Network Process survived over the years because it was timeless. It had been developed jointly by General Motors management and the UAW, based on a set of beliefs and values that stood the test of time. The beliefs and values had been the result of an extensive study in which the question was posed, "How should people be treated in the company?" It was a wrinkle of the "Golden Rule," and those fundamentals culminated in a vision of "Customer satisfaction through people, teamwork and continuous improvement."

There was even discussion that the name should be changed, but those discussions gradually evaporated as the phrase "Quality Network" became a common term throughout the system. Its ideals were universally accepted.

In the year 2007 the leadership of the UAW thought the role that they were playing was diminishing along with their membership numbers. As corporations became global, the UAW realized it needed to seek new members in the emerging nations of the world. The emphasis on North America changed to a global view. In the process, they targeted all global automotive OEMs and their tier suppliers. The original union values to improve the human rights of workers and remove oppressive conditions were the cornerstone of the UAW's global strategy.

Countries from Kazakstan to Saipan became the domain of the UAW. And in 2015, Mathew Tanaka, International President of the UAW, was awarded the Nobel Peace Prize for his efforts in ending the war between the workers in Turkmenistan and their Russian corporate leaders. The workers in this central Asian nation armed themselves against their Russian employers who

were treating them as slaves. Dr. Tanaka was able to eliminate the oppression and end all the violence toward the workers.

By 2020, "cars" as they were known in the early part of the 21st century no longer existed. Their legacy of personal transportation was the PTV, completely driven by computers coming in all shapes and sizes. The enormous global supply base to the old automotive industry was very adaptive. They were able to change over to the ever changing industry needs through their own capabilities since so much of the transportation knowledge in the latter part of the 20th century already resided inside their companies. The UAW, as well, realized that their new membership around the world needed the knowledge necessary to help the global industry, and their major value-add was providing those knowledge based manufacturing workers. Education and training had become the single greatest activity within the union.

By 2025, workers around the world were represented. Working and living conditions soared. So did the quality of life around the world. It was increasingly difficult to decide who was a "worker," and who was a "non-worker." Almost everyone was a worker and a manager and a leader. As labor-intensive jobs were gradually replaced with machines, every worker was a thinker, a problem solver, and a team player. Manufacturing facilities had an increasing number of workers with advanced degrees. The difference between workers in the manufacturing facilities and senior management blurred.

In addition, governments around the world took America's lead in protecting workers' health and safety. Many within the union itself questioned whether the UAW still had a mission.

The largest supplier to the PTV industry in 2085 is Delphi Services, whose ancient liaison with General Motors had been terminated at the turn of the century. The UAW decided to choose Delphi for an experiment in 2030 to see if PTV modular construction could occur in a Delphi facility with a different kind of relationship with the workers. After all, Delphi assembled PTVs for every OEM in the world. What if the workers weren't Delphi employees, but UAW employees, and the UAW didn't represented the people, but employed them? What if the UAW, in essence became a

corporation? Its customers would then contract this corporation for its employees; the UAW's former members?

Over a period of a decade, that was exactly what occurred. The United Transportation Services Corporation (UTS) emerged as a global organization employing all the UAW's former members as well as most union leadership. The UAW, as a union, gradually dissolved. UTS quickly emerged as the world's largest corporation, supplying the knowledge-based workers for the transportation industry using their wonderful Quality Network process. Although UTS was a publicly traded company, it's employees still owned much of the stock and operated the company...very profitably.

As part of the original fire sale, IBM sold off several brand names to some Tier 1 interior suppliers. One snapped up the Cadillac name for luxury interiors. Another used Chevrolet for entry-level family interiors.

Along with the PTVs, there were many systems of mass transit throughout the solar system. Kiri had predicted this future the moment she realized the ramifications of her work so many years ago.

All of this history was foremost in Benson's mind as he thought about his day, ahead.

Chapter 2

Earth

Benson's wake-up alarm always told him what he needed to know first thing in the morning. He programmed it the night before.

"Oooo...it's so early. Maybe I had too much champagne last night. But, I better get moving. It's going to be a big day," Benson said to himself.

By the time the shuttle left, Benson was already concerned about how his presentation would go in front of the new company elders. It was easy to communicate in a virtual world, but reality?

Looking out of the shuttle, Benson saw the huge solar satellites collecting energy from the sun. Most of the Earth and its satellite cities use solar energy, including most PTVs and PTV hybrids. Solar energy is microwaved to Earth, and then beamed to power everything on Earth. Smaller versions of these solar satellites power the Moon and Mars.

PTVs move people and their cargo. On the Earth, they move, like hovercraft, over relatively flat spaces. Most road surfaces are green by law since the ozone hole has to stay closed. The bulk of the land mass on Earth is planted with special genetically engineered plants to ensure clean air. It took a few decades but, finally, the ozone hole was eliminated.

PTVs are available in any size - tailored for any number of people up to eight. Each one is uniquely designed by its buyer, based on the almost infinite combinations of modules. These modules come together to create vehicles that are programmed to transport people almost anywhere on the planet, satellite, or moon. It is quick, safe and inexpensive transportation. It is against the law for a person to manually drive a PTV. Driving is only for emergencies. Since this law passed, deaths from PTV accidents were reduced more than 99.9%. Computers make far better drivers than any human.

Vehicles operate on solar power as well as electric energy supplied by electric batteries they carry for emergency backup. The transformation of solar energy into electricity was improved greatly in the 20s when breakthroughs of efficiencies were accidentally uncovered by the Ford Sony Boeing Group. Since that time, FSB has remained the largest transportation company in the system, manufacturing PTVs as well as most mass transit ships.

Most mass transit is powered using nuclear fusion. Although the use of nuclear fission was used in the twentieth century, its toxic side effects were simply intolerable and all fission use ceased in the early part of this century.

No sooner did the shuttle take off, when Benson realized they were docking at the plant. The new plant manager, Ito Suzuki and several of his assistants boarded the shuttle.

"Chadwick-san," Suzuki said as he greeted Benson. "I never like these weightless shuttle rides, but, I'm glad that you're here. We can visit on the way and I want to ask you some questions."

Benson smiled and slightly bowed his head. He knew Suzuki well…one of the best plant managers in the system.

"Well Benson, do you like the quality of the PTV electronics coming out of the plant these days...best in history, with the clean, smart manufacturing available on the space station?"

Benson looked at Suzuki and said, "The quality levels are fabulous. But, the PTVs still need some of the design characteristics that my customers are asking for."

Suzuki looked at Benson. "I know. We're still working to keep up with the new technology as it comes moment by moment. Our modular molecular construction is great, but it is hard to keep up with technologies that change every nanosecond. But, you know our bio-adaptation electronics are getting very close."

Benson was pleased to hear that the company was working on the right

things.

Before long, they felt the forces of reentry, as the weightless environment they were in gradually grew in gee-forces. The Los Angeles Metroplex Launch Port was now in view. In a few moments, they would be on their way by bullet train to the conference area.

The IBM conference was held at the great Los Angeles Metroplex resort of Santa Barbara, California, in one of the original hotels of the last century, overlooking the Pacific Ocean. Many new resorts on the planet are underground, but Santa Barbara's is still on the surface of the planet, so it is quite a treat to go there.

Living is mainly underground, too, since the surface of the planet is used for growing vegetation to support clean air and food for the population. Earth has had a self sustaining ecosystem for thirty years, since the fifties, when the entire consciousness of the planet improved. Transportation is under ground, on the planet's surface and in the air. Mass transit is prevalent everywhere populations live; both individuals and communities "own" an assortment of PTVs, the product that Benson sells to his many customers.

Benson's presentation to the IBM senior leadership includes his plans for marketing the newest generation of PTVs on all satellites, the Moon and Mars. His toughest customer is the Chairman of the Board, Yukio Kunisada.

Benson checked into his room. He was first up on the meeting's agenda, and he wanted to change his clothes to look more formal. As an expert in on- and off-world cultures, Benson knew that it required considerable research to meet the special marketing needs of the twelve different cultures on the satellite space stations, on the Moon and on Mars. He knew his task for this conference. He had to explain to the company senior leadership that the needs of the unique populations were as different as the variations in cultures on Earth -- maybe more.

Even in an intelligent wireless world, marketing and advertising require that data, information, and knowledge all need to be put in context, to understand specific populations and their needs. Needs segmentation is not a new idea. It is one of those old ideas that became popular in the last century.

Benson knows that PTVs on Mars, for example, when used outside of the biosphere dome, need to be able to crawl on the surface of the planet and hold all of the essentials of life. Inside the dome, more traditional PTVs are fine. The same is true on the surface of the Moon, but Lunies expect many more comforts than the pioneers on the frontier of Mars.

PTVs are the essence of smart vehicles. All the customer needs to do is tell the PTV where they want to go and the PTV does all the rest. Recently, however, customers on Asimov want a new feature. They want to "drive" PTVs as a recreation on the surface of Asimov, the space station city that is used mostly for vacations. The requests are very frustrating for Benson and IBM. He knows that the System Safety and Environmental Council (SSEC) won't permit them to meet their customer's needs without a fight. A great political battle is about to ensue, just the kind of assignment a diplomat might enjoy. Remember, humans are not permitted to drive PTVs by law almost anywhere in the System.

Benson also knew that there were going to be many questions about this as he stood up in front of the group that had gathered at the conference. His friend, Jim Swenson introduced him.

"I give you Dr. Benson Chadwick," he said, and Benson began.

"Thank you for asking me to give you an up-date on the PTV marketing issues I am facing regarding the twelve space station satellites, the Moon and Mars," Benson said carefully, trying to read the crowd.

"I know many of you have questions about the situation on Asimov and the SSEC. But, if you will be patient, I will answer all of your questions after my presentation."

Little by little, Benson went through all the research results. He said, "So, in summary, this is what the customers want, broken down by type of customer and location, and as you can see, we can fill all of their requests with the technology of today."

"Unfortunately," Benson concluded, "the political challenges are going to be

far greater than the technological, engineering, manufacturing or marketing ones."

"Great job, Chadwick-san," said Suzuki. "Now we have to all work together to figure out how we can sway the leaders of the SSEC - though I know that will take time."

Kunisada smiled, and bowed.

And, with that, Benson got a nice ovation. It was a first for him. He had guessed right about what to say, in this real encounter with his many bosses. As he sat down, he breathed a sigh of relief.

Chapter 3

Galileo

"Has it really been ten years since we were at Princeton?" Benson asked thoughtfully as he looked across the table at his wife, Yoshiko.

"It seems as if it was only yesterday when we met in that Techno-anthropology course," she replied. They looked at each other both remembering fondly their University days together. Here they were, ten years later celebrating their wedding anniversary in their favorite Parisian restaurant, Chez Pierre.

The fabulous restaurant is one of many the couple has enjoyed since moving to the Galileo space station. Galileo is, in effect, a city in orbit around the Earth. Tonight, the weather is very clear as they are passing over Australia. Through the large window beside them, they have a stunning view of the twinkling lights of the larger cities.

Yoshiko smiled, "remember how hard it was in the beginning?"

Benson nodded in agreement. "We were so young and it was such a big decision to take jobs that weren't on Earth."

"IBM offered us these jobs on Galileo when we had only been married a few months." Yoshiko sighed.

"We're lucky, though. We've had opportunities that we couldn't have had on Earth. Of course, the move and saying good-bye was hard, but we have a new life and children of our own now," Benson said, smiling.

It had been hard for both of them. They missed Earth, missed their homes and families, and it was sometimes too difficult to visit. At first, life off the planet seemed like it could be very difficult. Soon, though, they had discovered that it was not very different from living in most small cities on Earth. The biggest difference was that IBM invested a great deal in the recreational amusements and restaurant facilities on the satellite station, mostly to make it an attractive place for people to live and work.

Shortly after the couple had been married, IBM contacted Benson and Yoshiko offering them both management jobs with high possibilities for advancement. The only catch was that the jobs were on the Galileo space station. IBM wanted Benson to take on a large off-world territory as a sales manager. He was well qualified for this work because of his understanding of multiple cultures. Yoshiko was offered a position as an environmental scientist in the same location. Hiring of couples was very commonplace when companies wanted people to move off of the Earth for their work. Opportunities needed to exist for both spouses.

Benson Chadwick was born and raised in Cleveland, Ohio. He was educated at The Ohio State University where he graduated summa cum laude with a degree in Electronics Engineering. He then went to Princeton University for his graduate degree in On- and Off-World Cross Cultural Studies. Like other students who received this degree, Benson prepared for a life as a diplomat. While Benson was at Princeton, he fell in love with Yoshiko Einstein, who had gone to Wellesley as an undergraduate and was working toward her advanced degree in Environmental Science. The beautiful countryside of Princeton, New Jersey was the perfect place for a romance, however, they both knew that the life of a diplomat and a scientist might take them anywhere. Although they were a typical professional couple, they never dreamed of what was to come.

Benson and Yoshiko took the jobs and moved to Galileo, the location of the IBM headquarters. The headquarters were located on the satellite to show the company's progressive side and to eliminate the political barriers created when companies located their headquarters in a country on Earth.

Galileo was a space station "city" with a population of twelve thousand people, about the size of Princeton, New Jersey. It was one of twelve Earth orbiting cities and like many 21st century families, the Chadwicks lived, worked, and played on their satellite space station home. They also had the ability to travel around the inner solar system. People lived on the Earth and its satellite cities; the Moon and Mars, under their biosphere domes; and several other "satellite space stations" that were in various positions throughout the "inner" system and were used for many different purposes.

Each off-world dwelling is unique. The cities of the sky offer people an exiting place to visit or live. Specifically, Galileo is known for its professional zero-gee basketball team, the Gravitons which are the system champions. Galileo is also known for the Galileo Symphony Orchestra, and Galileo boasts the largest off-world music hall in the system. It is also the home to some of the finest in off-world dining options, system wide. Several famous chefs from all over the world have been brought to Galileo for a multiplicity of restaurants such as Indian, Thai, Japanese, Chinese, German, French, Martian, Italian, Spanish, Pythagorean, Mexican, and "healthy old-fashioned American," from McDonalds.

Benson and Yoshiko were celebrating their 10th wedding anniversary. They had two children, Anna and Peter, who were both born on Galileo. Anna was 8 years old, and Peter was 5. Yoshiko looked at Benson. She could tell he was thinking about work, but she was determined to talk about their daughter, Anna.

"You won't believe the conversation Anna and I had yesterday morning," Yoshiko said. "Anna asked me when she would see me. She was afraid I had forgotten that her concert was last night. I told her we would be there, even though we had holo-meetings scheduled."

"You must have reminded her that the PTV is programmed to take her there . . . she was there early, and the two of us weren't even late," said Benson.

"Of course," Yoshiko said, "and I promised we would be there on time. I don't think she was convinced though. It's just a good thing that our meetings ended soon enough. I wish we could be less busy. I worry that we aren't with the kids as much as we should be."

"Nonsense, the kids are fine." said Benson. "Besides, it's our anniversary. Can't we talk about something other than the kids and the PTVs for one night? You know I'm worried about the situation on Asimov. I know you're working on the environmental impact statement of what will happen if PTVs become drivable. What do you think?"

"I think," said Yoshiko, "that there are other forces at work in this situation. I can't put my finger on it. Call it woman's intuition. But, something else is

going on. Maybe a power struggle of some kind."

"I wonder." Benson just thought. It was hard enough to understand why anyone would want to drive a PTV anyway.

Each day, Benson, Yoshiko and the kids travel around in their own PTVs. The PTVs are already programmed for work and school and can have special adjustments for special events like a concert at school or an in-person meeting at an office. The vehicles travel to the school on the station and Benson goes to the spaceport to commute to his office, an Earth orbiting satellite at the electronics plant, like most manufacturing complexes. It rotates to generate gravitational forces emulating those of Earth, like Galileo, itself. That way, people can commute from Earth or any other Earth-like dwelling place without physical side effects from a change in gravitation. The commute occurs under zero-gee conditions and takes about an hour. This is the time everyday when Benson looks at his schedule to prepare and plan out the day's activities. Yoshiko works mostly from her office at home so she can be near the kids if she's needed. But, when she needs to do experiments, she works in the Galileo Environmental Laboratory. She also travels to places all over the solar system to collect data for her work.

Yoshiko wasn't ready to give up on the conversation, "Peter and Anna are both upset that we have to spend so much more time in holo-meetings and PTVs than we get to spend with them on the important things." Yoshiko sighed, "I guess that's the way it's always been for working parents."

Benson shrugged his shoulders saying, "I guess so. But you know kids are never satisfied. First, they want their own PTVs, then they want holo-programs, com systems and digitizers. Before you know it, their neuron paths are addicted to the web games, and it gets tougher and tougher to bring them back to reality. What's this new generation coming to?"

Yoshiko smiled. "Benson, if I remember correctly you played your fair share of net games when you were young and you turned out all right."

Benson looked at Yoshiko and changed the subject, "Honey, do you remember Jim Swenson from the plant? He was telling me about this new

technology everybody has been talking about. It's a material grown from biomass. It's really smart. Apparently, it doesn't just remember its shape, it actually repairs itself; heals itself. Jim says the Chinese organized crime syndicate, the triads, are trying to control the material."

Yoshiko looked worried. "Triads. That doesn't sound good for us at IBM."

"No, it isn't," Benson said, "Are you ready? Let's e-pay and get going." She nodded, as he put their pay-card in the slot provided for scanning.

Yoshiko smiled, "You know it always amazes me that the food here at Chez Pierre is just as good as the best restaurants in Paris, even though all the plants are grown in hydroponic gardens, here on the station." He nodded agreeing, "Well Happy Anniversary, Sweetheart."

"Happy Anniversary Benson", Yoshiko smiled. They hadn't finished their discussion about the kids, but she didn't really question that Benson loved his family. What still worried her was their discussion of Asimov, and the apparent increasing role of the Triads.

Chapter 4

Luna

"Anna, hurry up!" Peter called to his big sister as they were getting ready to leave.

"I'm coming," said Anna. She was having trouble with her bag, "It's a very long trip to the Moon, and I don't want to leave anything important behind."

Peter was excited. He had never gone to the Moon before.

Anna was older than Peter. She knew the story of how when Aunt Ingrid was a teenager, she had gone to Mars to study the fossils of the primitive extinct bacteria that had inhabited the Martian soil several billion years ago. When she was 19, she had come back to Hiriyama University on the Moon to get her degrees. She longed to return to Mars and had saved up money all of her six years on the Moon so she could go back and settle there.

In 2057, Aunt Ingrid returned to Mars, this time to make it her home. There, she met and later married, Leonard Chadwick, an archeologist, like herself, with an almost equal obsession with Mars. Their daughter, Natalia, was born on Mars in 2062 and was getting married in a week to Ishmael Jackson. He was a comparative geologist on Newton, a satellite that orbits Earth. He met Natalia on a trip to Earth, on his way back from a research trip to Deimos, Mars's smaller moon. The several month trip made for an interesting romance on the cycling spaceship that transports people from near Earth to Mars and its satellites. The two met at the ship's gym, where each was ordered to exercise at least an hour a day to avoid bone loss and to maintain the strength of their muscles in the low-gee environment.

Natalia was also a Hiriyama graduate. She was a robotics engineer on Mars. Ishmael was offered a great job as a mining geologist on Mars, but he and Natalia decided to hold their wedding on the Moon because Martians have difficulty spending time under earth gravity. Also, they had a lot of family and friends on and near Earth who could not visit them on Mars, not even for a wedding. After the wedding, they would begin the long trip back to

Mars on the cycling space ship. Natalia and Ishmael would live on Mars where they would both work. Ishmael would study the differences between Martian and Earth geology.

Benson Chadwick called to his kids, "Its time to get into the PTV or we'll be late."

The kids shuffled past their dad and took their seats around the table of the PTV. Yoshiko followed behind them with one more bag, which she stowed under the seats with the others. Everyone took their seats and fastened their safety belts. The door slid shut and the PTV began to move.

Benson was reading from a holo-document for work. He was thinking about the problems on Asimov and how he was going to have to deal with the SSEC Chairman, Boris Chin. How was he going to find a way to get the SSEC to give IBM the contract to make PTVs that were drivable?

Yoshiko was helping the kids with the crossword puzzle they were doing on the large computer screen on the table in front of them. Of course, the PTV did the driving.

"What is a 9 letter word ending in "r" meaning the stage during gravitational collapse, but before the nuclear reactions begin in a stellar body?" Anna read.

"That's easy" said Peter, "It's a protostar!"

Yoshiko turned to her husband, "Benson, can you think of a composer who wrote a Requiem in German, 6 letters?"

"How many letters in Brahms?"

The PTV came to a stop. They had arrived at Brahe spaceport. They walked through to the check-in desk to find out if the shuttles were running on time and to check their bags. After passing by the security robots, the family took the slide walk to docking bay D29 where they waited to board the shuttle. The shuttle ride was only a couple of days long. The Chadwicks continued to work on their crossword puzzle, eat, sleep and play,

and in no time at all, they were landing under the biosphere dome of Kepler, one of the Moon's larger cities.

Natalia was staying with Ishmael's parents, in Kepler, Donald and Barbara Jackson. They had made arrangements for the wedding guests to stay at the Lunar Highlands Plaza Hotel; the wedding reception would be in the ballroom. The wedding itself would be in the Kepler Zen Judeo Christian Chapel. The Minister would perform the ceremony. Natalia and Ishmael had written their vows and would recite them.

Ishmael's mom, Barbara, had been in tears for several months. The thought that her son was moving to Mars, a two month trip away, was too much. She wanted to make sure Ishmael and Natalia would promise to find ways to see them, though, realistically, she knew in her heart, that their new life together would not include her and her husband. For her, this match was not made in heaven. It was taking her son away, perhaps, forever. Maybe, after her husband retired, they could take a year or two and come and visit? How would she ever see her grandchildren?

"These mixed marriages never work out. A Luny and a Martian?" she said to Donald, one day.

"Now, don't be so prejudiced," Donald replied. "You know I don't approve."

Natalia reminded her future mother-in-law that through holomessages, they could communicate every week and it would be just like being there. True, it took five minutes or so for a message to come from Mars, and another five minutes for an answer, so that wasn't bad. Ishmael's mom was so old fashioned.

Ingrid and Leonard had left Mars to visit the Moon for the wedding. While on the cycling spaceship, they checked in on their Mars "dig" located outside their biosphere dome in a region rich with fossils. The "dig" was manned by several robots that did all the jobs archeologists used to do, like digging, charting, archiving, labeling and recording. The recordings were made by a system of surrounding cameras that viewed the "dig" from all possible angles, allowing the human archeologists to examine the "dig" from

anywhere in the system, using virtual reality programs. The system was called the Scientific Accuracy Virtual Reality System or SAVRS.

"Oh! I'm so excited," said Ingrid to Leonard as she entered the hotel.

"Our work is going so well, and, now our daughter's getting married, and will be back home so we can all be together."

Leonard smiled. He knew it was going to cost a fortune having this wedding where so many people could come. But, after all, he only had one child, and he wanted her to be happy.

"Why couldn't they have eloped on Asimov?" he asked himself.

But, Leonard also knew how lucky he was. Mars wasn't around the corner, and he knew how upset Ishmael's parents were that their son had decided to live and work on Mars.

Within a few moments, they were joined by Natalia, Ishmael, the Jacksons, Benson, Ingrid, Anna, Peter, and other guests in the lobby of the hotel. At one sixth gee, those from earth felt light as a feather and, of course, it made them feel great. Everyone felt great, except Ishmael's mom, who was still teary-eyed. Ingrid assured her that the trip to and from Mars was easy to make, and they would always have a place to stay when they came to visit on Mars. Little by little, Barbara calmed down.

Benson was so pleased to visit with his brother, Leonard. They were always best friends. Benson shared his concerns about Asimov with Leonard. He always had such good ideas.

"The Moon was the best place for our wedding, Mom," Natalia said as she gave her mother a big hug and kiss. She turned to her father and said, "Thanks for everything, Dad. You know we're going to have a great time on our honeymoon going back to Mars. I'm so glad you and Mom are going to stick around here for awhile so we can be alone. And, the next cycling space ship will get you to Mars just a few weeks after we get there... we'll have all the time in the world to be together after that."

Leonard looked at his daughter. “You know I want you to be happy. Besides, Mom and I intend to go down to Earth to the big archeological conference being held in Cairo. Then, we’re going to spend some more time visiting with Uncle Benson and Aunt Yoshiko on Galileo. The timing couldn’t have been better.”

Donald Jackson said, “I’ve ordered the perfect weather for your wedding under the biosphere dome. I spoke to the dome management council and they programmed the system to ensure perfect temperature and humidity. And, of course, no rain to worry about.”

The whole wedding party had to be fitted for their wedding clothes. Anna, too, was terribly excited because she was going to be the flower girl. All the ladies, including Anna, were helping with last minute errands for the wedding. There were flowers to get at the hydroponic gardens and Anna’s dress needed to be made by taking a scan of her body measurements so the robots could put together a gown to fit her perfectly. Anna normally didn’t like having dresses “fitted” as it involved standing still for the scanner, but her enthusiasm for the pretty dress helped her remember not to move.

“And, by the way,” said Ingrid to Natalia, “We knew you had something new, something borrowed, and something blue. I promised to bring you something old. Here, on this gold chain, which belonged to your Great Grandmother Kiri, we have mounted, encased in a gold setting, a lavaliere, of an especially beautiful Martian fossil.”

By the time they all got to the Chapel, everyone knew this would be a special day. Finally, the time came. Ishmael and Natalia said, “I do,” and it was sealed with a kiss.

Benson thought to himself, “thank goodness, some things never change.”

Chapter 5

Lessons from Venus

"Bonjour, Dr. Chadwick. May I invite you to attend the 84th Annual Earth Environmental Conference for Senior Leadership and present a paper on your work studying the 'greenhouse effect' on Venus and other places?"

The holomessage was in front of her, and a familiar face was asking the question. It was the chairman of her doctoral committee from Princeton.

"Dr. Saint-Germain. How nice to see you. Of course, I would be delighted to," said Yoshiko to her former professor.

"Will you be there?" she asked.

"Yes, Yoshiko, and the committee felt your proposal was outstanding. We are very eager to hear what you have to say. Remember, it will be at the new Paris Hilton. Do you think that IBM will permit you to share your results on the environmental impact study of drivable PTVs on Asimov?"

"Oh, sir, I doubt it. IBM must be very careful about the situation on Asimov. I am not even at liberty to discuss it with you," she answered.

"I understand, Yoshiko. Why don't you bring Benson along with you? We would love to see you, both."

"I'll ask him. One way or another, I'll be there."

"See you soon, then," he said. "Au revoir."

When Yoshiko Einstein Chadwick received her Ph.D. from Princeton University in environmental science, she had a curious minor. She was always interested in the planetary warming which occurred with the "greenhouse effect" on planets, like Earth and Venus, so she minored in Venusian Science, since the "greenhouse effect" was so prominent on Venus and it might provide hints to save the Earth from such a terrible fate.

"Benson, Dr. Saint-Germain called on holo and the committee invited me to give my paper at the Paris environmental conference. He's hoping you'll come, too...What do you think?"

"I think it's great. Do you think they may talk about the new materials and their environmental impacts? Because, if they are, I might be able to go with you. We could ask my Mom to come up and watch the kids, so we can go to Earth for a long weekend. I think IBM would consider it worthwhile for me. What do you think?"

"As if you need to ask me. I'll call your Mom."

"So, Grandma Cema is coming to watch us for a few days. That's great! She always brings us fun stuff to play with from Earth and once she gets here, we have a great time," said Peter.

"Hooray! Grandma Cema's coming. That means great things to eat, too," said Anna.

Yoshiko grimaced. "Do you think she spoils the children too much?" she asked Benson.

"No way. That's what grandparents are for...I wonder why Dr. Saint-Germain wanted me to come, too? Just because he hasn't seen us for a while? Hmmm."

Yoshiko asked for the complete conference guide over holo, and it was transmitted within moments.

"Guess who is going to talk about the recycling of nanotechnological robots that have done their jobs collecting toxic waste from cites on the Earth? Mary Beth Livingstone. Remember her? She was one of your professors at Ohio State. I heard she is doing some very interesting work in that arena."

"Gee, I haven't seen her for years. Is there an image?" said Benson.

"Wow. She looks great. Hasn't aged a day," Yoshiko added.

Benson nodded.

"And look who else is speaking! Jim Swenson is making a presentation on those smart materials he was talking about. Funny. He never said a word to me about the fact that he was doing this. I wonder if he knows you will be presenting?"

Yoshiko was sure that Benson was coming.

"Listen to the description of his presentation,"

"Bioelectronics is a mature science, today. Now that most of the social issues regarding the use of biological creatures have been resolved, today's materials are 'alive.' They grow themselves, heal themselves and are embedded with artificial intelligence so they are 'smart.' Most things, including all vehicles, are made from them. As long as you feed them, they are happy! There are only a few known environmental issues associated with the recycling of the bioelectronics materials, and this presentation will explore them."

"He's lost his mind, Yoshiko," Benson said.

"There are still lots of ethical and legal questions to iron out. So many people are still against the enslavement of microbes, and even the smartest of microbes has been unable to communicate a consensus of their species."

Yoshiko nodded, saying, "I know."

"It has led to the whole debate over the right and wrong applications of science." Benson said. "You bet I'm coming to the conference…if for no other reason than to help Jim."

Benson sent a holo message to Jim Swenson. "Just thought I'd let you know that I'm going to attend the Paris environmental conference to hear Yoshiko's presentation. Saw your presentation write-up. How do you expect to deal with the controversy? This may not be a good time...as you know, we are in the middle of a major problem on Asimov."

Jim Swenson came over holo. "Well, the company asked me to make the presentation and tell our side of the story. You think I'm going to have lots of problems?"

"Yes." said Benson. "But, as long as you're prepared, I guess we'll be all right. But, if it's too controversial, it may effect our situation in dealing with the SSEC on Asimov, where we are hoping to get the lucrative contract to develop and manufacture drivable PTVs."

"Don't worry, Benson." said Jim. "I've handled the worst of the MRM (Microbe Rights Movement,) and I'm sure I'll survive this one."

Dr. Saint-Germain rose to introduce Yoshiko.

"Today, I have the pleasure to introduce my colleague, Dr. Yoshiko Einstein Chadwick. Her pioneering work in the 'greenhouse effect,' has enabled scientists today to make quantum leaps in reversing those effects on Earth. May I present Dr. Chadwick."

Yoshiko began,

"In the last century, the realities of Venus became evident. For many years, people thought of Venus as a sister planet to the Earth; similar in size, and, perhaps, similar in the atmosphere that surrounded it. But, as the decades of the last century unfolded, and the research mounted, it became very clear what Venus was really like. A rocky surface that is very, very hot - 480 degrees Centigrade - almost five times hotter than the temperature required to boil water on Earth. The atmosphere is crushing; 90 times the pressure people on Earth feel from their atmosphere. The Venusian atmosphere is composed of 96% carbon dioxide. There are other gas traces in the atmosphere, but, the famous clouds of Venus, which people have seen for centuries, are not like clouds on the Earth. The clouds are made up of a concentrated solution of sulfuric acid with a little bit of hydrochloric acid and hydrofluoric acid. Not a nice place to visit, and certainly not a place where people would like to live. Certainly not like a sister to the Earth."

She continued, "Unfortunately, man made chemicals in the last century, and

various kinds of pollution, coupled with the devastating effects of deforestation of much of the Earth, especially its rain forests, began to produce the potentially catastrophic 'greenhouse effect.' When left unchecked these began to produce Venus-like effects on Earth. The rain in many places on the planet turned acidic, and forests began to die. In fact, there was some evidence to suggest Earth as an eco-system would die completely, as species began to become extinct at ever increasing rates."

"Fortunately, by the later part of the last century, corporations began to understand the role they had to play to arrest the situation. They began by working with governments instead of against them, to make it profitable to do things that were good for the environment. It was hard work as well as expensive to make industry clean, but this work is crucial and must be kept up at the stringent levels at which it now exists in order to continue to keep the environment of the Earth one which will remain a healthy and safe one for future generations. Today, the people of Earth can breathe a sigh of relief because there is little cause for alarm. The fragile eco-system of the Earth is alive and well."

Yoshiko outlined all her recent work on Galileo, and how the study of artificial environments on satellites and biosphere domes was adding to the understanding of the science.

"...And, in conclusion, I thank Venus. It has taught us much about the Earth and how to keep it healthy for generations to come."

To her surprise, people had lots of questions and comments. Even Benson thought it was interesting.

The whole conference had been great. Jim's presentation was masterfully done. The IBM position was well received. It helped that the microbial spokesperson had much to say that was positive about the wonderful way microbes live in the IBM environment. And, fortunately, nobody asked about the situation on Asimov.

Paris was lots of fun, too, and the food tasted just as good or even better than Chez Pierre!

Chapter 6

"Fred"

Yoshiko was on Asimov, studying the environmental impact of drivable PTVs. Benson had to look after the children. Fortunately, they would be at the Virtual Reality Center (VRC) all day. He had lots of work to do. How would he convince the SSEC to permit IBM to develop and build the drivable PTVs?

As he thought about the many challenges, he heard Anna and Peter run to the PTV.

"Bye, Dad," said Anna. Benson heard the PTV talking to the children.

"Good Morning. Your PTV is programmed to take you to the VRC (Virtual Reality Center) for your field trip today with the rest of your class...travel time, three minutes and twenty-seven seconds," said the PTV console as Anna and Peter entered the PTV and fastened their safety belts. Anna had nicknamed the PTV announcer, "Fred."

"Thanks, Fred," said Anna.

"Anna, why do you talk to that thing?" Peter asked. "It's not alive, so why bother?"

"Because, he feels alive to me, and I like him," said Anna.

"It isn't even a him. It's a synthesized voice. You're crazy."

"Well," said Anna. "I may be crazy, but I have one more friend that you have. I have Fred as my friend, too."

By the time the two had stopped bickering, Fred announced, "Welcome to the VRC. Hope you had a pleasant ride. I shall wait for you, here, to take you back home. Have a wonderful day."

"Good-bye Fred. You have a pleasant day, too," Anna said sticking her tongue out at Peter.

"Good morning, Anna and Peter," said Jean-Paul Valdez. "Come on in and have a seat at your learning station so we can begin. We're going to Saturn, today, and we need to get started."

Jean-Paul Valdez was a typical off-world teacher. He had lived on several different satellites and had spent time living on the Moon, on Mars, and on the Earth. His job was to help his students augment their technical education with the socialization process which research had proven was essential to develop healthy and happy children. This required bringing the students together, face to face, with much interpersonal dynamics, since their formal technical education was usually done in their homes via the satellite network. Without the opportunity to communicate with one another, children did not learn to build relationships, and relationship building was a crucial element of learning. Another element of Jean-Paul's job was to help students integrate the lessons they learned to other lessons, and show how their work related to life. This was the learning process that had been perfected over the years.

In the year 2007, a group of United States universities, who called themselves the "Big Ten," partnered with the Microsoft Satellite Network to produce the capability to obtain a university degree anywhere on the planet's surface from any one of their institutions through a "distance learning" virtual process. They were all land grant colleges and in the spirit of teaching the masses, decided it was their fate to teach the masses of the world. It was a giant success beyond anyone's expectations. In fact, by 2025, the increased level of global consciousness changed the face and history of the world. The same Microsoft Satellite Network permitted students on the satellites, the Moon and Mars to learn from the great masters, wherever they are.

In the first twenty years of operation, two billion people on the planet received educations from the "Big Ten" Microsoft Global Educational Satellites, and in the process, adopted the values of peace, prosperity, and freedom for all, around the world. As the general population of the planet became better educated, the world population gradually declined, so that by

the year 2067, the population of the planet was again at the levels of the turn of the century. In addition, the people of the planet were so involved in creating value, increasing living standards, and working on the "real" challenges, like eliminating illiteracy and global warming, that war-like conflicts also steadily declined. By 2085, there is almost a total peace on the planet.

One graduate student team in India, in 2022, worked on a way to attack the problem of famine in the world. Using the systems theories of the great American statistician, Dr. W. Edwards Deming, and with some assistance from several corporate partners, they found unique solutions so that famine was almost wiped out through better global management of resources. This required global thinking that integrated non-linear solutions by looking at population control, education, distribution of food, political maneuvering and improved genetic engineering principles as a single complex adaptive system.

Genetic engineering was being explored for its benefits to mankind by many different global teams composed of representatives of all major stakeholders. These teams included students, industry experts, government officials, university scientists, religious leaders, and medical professionals who came together to create mutually acceptable terms for the legislation of this new technology.

Genetic engineering of peoples' personality characteristics is prohibited by global law. However, it is permitted for the elimination of most diseases. The average life expectancy of the general population has soared to 115. Since people live so long, they no longer have the attitude that permits the "next generation" to solve a problem they created. Generations experience the consequences of their decisions. People also work in careers that last for eighty years. Because so much knowledge changes continuously, life-long learning is a major activity of most working adults. The formal education of children begins at birth, and continues until about the age of 25. Then, the life-long learning process kicks in.

Anna and Peter like to do their lessons on their own personal schedules, so classes with Jean-Paul, which have to be scheduled, are inconvenient. Even so, Anna and Peter have a great time in his classes. Anna also loves virtual

books. Books made of paper are not obsolete. Many people still prefer to read from a printed page, as opposed to an illuminated screen. This is especially true for children. But, most books are not made of paper, but a digitized reality that enables the reader to read and feel the v-book (virtual) as though it were made of paper. The children have seen real books in the museums on the earth, but they couldn't tell the difference between v-books and the real thing.

The only paper book the Chadwicks own, was a gift from the Minister of their Zen Judeo-Christian Chapel. He presented them with a Zen Bible of the Old and New Testament and The Reformation Scriptures. It is cherished by all the family.

"Today, we're going to take a trip to Saturn. It will be a lot of fun. Who can tell me something about the planet we're going to visit via VR? Franklin Jones?"

Franklin Jones smiled. He considered himself the best student in the class. All the others moaned as Franklin began to speak.

"Saturn is the sixth planet from the sun. Saturn has the lowest mean density of all the planets, which means it is very light weight. Its rings are famous, and were first really seen by Galileo. The rings are made up of particles, though the rings are very thin. Saturn also has many natural satellites, or moons, and one major man-made satellite, called Maxwell, where scientists are studying the Saturn System. Some of the names of its moons are Phoebe, Iapetus, Hyperion, Titan, Tethys, Dione, Rhea, Enceladus, and Mimas. Its revolution period is..."

"Thank you very much, Franklin," Jean-Paul said, "Would anyone else care to add something else?"

Anna's hand went up.

"Yes, Anna?"

"My mother once told me that Saturn was so light that if there were a large enough ocean, you know, like they have on Earth, only bigger, Saturn would

float!" she said.

"Your mother is right, Anna. Let's go there, now, and see what it would be like to study Saturn if we were on Maxwell. Professor Satori, are you there? The children would like to ask you some questions. Children, this is Professor Yukio Satori, who will take us on a tour of Maxwell, and show us Saturn, up close."

Professor Satori was pleased that he had been asked to participate in this project. He believed the future of the solar system, and his work in it, depended on the attitude of the next generation toward the kind of work they were doing on Maxwell. For that reason, he took every opportunity to participate in VR interactive presentations.

"Professor Satori," asked Peter, "What would it be like living on the surface of Saturn? Would it be like living on the Moon?"

Professor Satori smiled. "Oh, no, my friend. It would not be like living on Earth's Moon, because we do not believe there is any surface; mainly gases of an atmosphere, mainly hydrogen and helium, the lightest gases of all. But, Saturn has many moons that do have surfaces and where biosphere domes might be built. Let's take a tour of the rings. Stand by."

As Anna and Peter looked out over the vast particle rings, they were very excited. When the VR program ended, the children whined, "Do we have to come home?" It had been a great experience and they had learned a lot.

"Remember, we're not taking a VR trip, but a real one next, to Earth. See you in two days, and remember, the trip will last five days. I have all the necessary permissions from your parents. Peter and Anna's mother, Dr. Yoshiko Chadwick, will be completing an assignment on Asimov and will be joining us as a chaperone, along with Ariel's parents, Drs. Sophocles and Antigone Saris. We are visiting the Smithsonian Institution in Washington, DC, the capital of the United States of America. Don't forget your lesson to prepare you." said Jean-Paul.

Anna got to Fred first. "Would you take me to Saturn, Fred?" she asked the PTV console.

"So sorry, Anna. I cannot take you to Saturn. That is an off-Galileo trip, and I am not able to leave our lovely home. But, perhaps, one day, you can catch a cycling space ship there?"

"Then I suppose you must take me home."

"Not without Peter. Ah, here he comes. Travel time, three minutes and twenty-seven seconds," said Fred.

"Think it would be exciting to live on Maxwell, Peter?"

"I think it would be boring. There's no planet close by to stand on…and so far away. I like living where we do. But, if *you* want to go there and live, I wouldn't mind," said Peter.

"You'd miss me if I left," said Anna.

"No, I wouldn't. But Fred would," said Peter.

"Have a wonderful afternoon," said Fred, as the children left the PTV.

"Good-bye, Fred," said Anna, as she pushed her brother gently.

"Dad...Anna pushed me."

"He started it."

Benson knew the kids were home. He wished he had had more time to work. He still wasn't sure what would need to be done on Asimov. He was leaving on vacation, soon and was hoping somehow it would all be settled by the time he got home.

Chapter 7

Crisis on Asimov

"Staying at the Disney-Sagan Resort on Asimov must be the greatest vacation, ever," said Peter.

"Well, the weather is always perfect, the food is always great, and non-fattening, and the rides are always fun," Yoshiko answered. "The trees and flowers are amongst the most beautiful in the system. They are meant to be as extraordinary as the most famous English gardens or the gardens of Versailles, in France. And, to some of us, sitting in a garden provides a wonderfully restorative feeling. Our little garden at home isn't the same."

In the middle of the century, plans began for Astro-Disney and its merger with the Sagan Resorts. A new Star Wars began; not a political war, but, a competition in which companies were going to be able to get contracts for the best spots on the satellite cities.

"Are we really going?" asked Anna.

"Yes, your trimester break is coming up and Dad and I think we could all use a little R & R. especially with all the work on the Asimov project" Yoshiko smiled.

Anna and Peter looked at each other, "We're going to Astro-Disney! Hoorah!"

The kids hadn't been so excited in ages; not since Grandma Cema took them to Sea World for the first time on Earth.

When the break came, they all packed their bags and got into the PTV to go to the spaceport. The family sat around the table looking at brochures on the viewsceen, planning what they were going to do while they waited to arrive. The shuttle ride was only about 50 minutes and the family took a tunnel train from the spaceport to the Disney-Sagan resort.

The suite had 3 small bedrooms, two bathrooms, a cozy living room with a 3 meter view screen, and a small kitchen area.

"This is going to be wonderful." Anna was glad she didn't have to share a room with Peter, and she was going to get to ride the new Space Mountain. Peter agreed, "I want to see Mickey and I want to drive a PTV!"

Benson shook his head from side to side. "Lets get settled in first, Peter. We have two weeks. I'm sure you'll get to see Mickey soon enough. And, you know, driving PTVs is against the law."

"But, you're going to fix that, Dad. I want to stay here forever."

"You know, we can't. Asimov is the only satellite that does not have Earth's gravity. It is deliberately set to make people feel light and happy, so you can't stay here too many weeks before you have to go back to a full gravitational environment, on a satellite, on Earth, or a spaceship. It's probably better, though. If we stayed here too long, we'd run out of money...and it's up to the SSEC whether PTVs will be driven, here. Not me."

It was a great day. The kids were exhausted even in the lighter gravitational environment. Yoshiko looked at Benson,

"Well, I'm tired. The kids are already asleep. And, I'm going to sleep, myself. By the way, there's a private holomessage for you."

"Chadwick-san," the holomessage said.

Benson recognized the bowing image, at once. It was Kunisada!

"I need your help. We have a crisis on our hands, and your skills as a diplomat are crucial to the survival of IBM. Yes, the very survival of the company is at stake. How this situation got so out of hand is beyond me. But, now that it has, we must act quickly."

"My friend, this is the situation. I, myself, have just learned the truth," he said.

"When Asimov was built, my predecessor, the late Merrill B. Sands, the Chairman of IBM, bribed the Chairman of the System Safety and Environmental Council, (SSEC) unbeknownst to anyone in the company. In the process, IBM broke dozens of laws in the System. We could be ruined. Our stock could plummet on the System Exchange. Of course, Sands wanted the SSEC Chairman to permit PTV driving on the satellite's surface, but as you know, that will take all kinds of exemptions, and usually, that kind of contract will only go to one company. At the time, IBM did not have the technology that we have today. So nothing happened."

"The Chairman of the SSEC, today, is Boris Chin. He wants the exemptions to go to CIMMCO (the China Motors and Manufacturing Company); not IBM, and, I believe he knows about the bribe of his predecessor, the late, Martin Garcia. Even though he knows the best technology for this project in the entire system now belongs to IBM, we have reason to believe he plans to use the bribery situation against us to help CIMMCO, as you Americans would say, 'kill two birds with one stone.' CIMMCO does not have the necessary technology. Why they want to punish us for the sins of a prior generation is beyond me, except for the politics, of course…and the profits."

"The SSEC is meeting on this issue, tomorrow, on Asimov. I am so sorry to interrupt your family's vacation, but, you are already there, and we need your help. We need to keep this out of the press, and we need you to talk to Chin and talk him out of this action before too much damage is done. Chin is an honorable man which is why I am puzzled. I think his actions may be out of fear of some of the Chinese organized crime figures, who hold stock in CIMMCO. They may have tried to persuade him to go with CIMMCO, to increase the value of their holdings. Perhaps, if we can find a way for him to do the right thing, and save face with his peers? I'm counting on you. If I come to Asimov, it will draw too much attention to this situation. Please call me in the morning on private holo and we can plan our strategy. Thank you, Chadwick-san."

Benson was stunned. How could he possibly convince Chin? He was so tired from the full day, he knew he'd better get some sleep. He would break the bad news tomorrow morning to Yoshiko and the kids. And, then, he would call Kunisada.

After breakfast, Yoshiko took the children to visit Mickey. "Good luck, Sweetheart. We're all counting on you," she said, as they waved good-bye. Now, he was alone. It was time to call Kunisada.

"Kunisada-san. I received your message last night. Do you have any ideas or a plan?" Benson asked.

"Not really, Chadwick-san. Only what I suggested in my holo. What about you?" Kunisada answered.

"Well, sir, I think I may have the answer. But, only because it is CIMMCO who is our major competition. If we were up against Toyota or the Ford Sony Boeing Group, we wouldn't have a prayer."

Benson continued.

"You know our technology is far superior to CIMMCO's. We could make a major issue of this if they choose CIMMCO, especially since it is our safety and environmental technology that are the best in the world. Toyota and Ford have better technology in other areas, but when people are on vacations, they are concerned about safety and the environment -- the strengths of IBM. CIMMCO is still catching up in all these areas. I promise you, Kunisada-san. We have a chance."

"Good luck, my friend. Let me know how things are going. Sayanara, Chadwick-san."

Benson asked the resort's computer how to reach and leave a message for Mr. Chin, Chairman of the SSEC. It said,

"Chairman Chin. I am Benson Chadwick. I have been asked by Yukio Kunisada, Chairman of IBM to speak with you about a matter that is most urgent. Please contact me, here, at the resort. Thank you for your kind consideration in this matter."

Within an hour, Benson received a response. Chin would see him in one hour.

The two met in Chin's suite.

"Mr. Chin, I am so pleased that you would take the time to meet with me," Benson said, as he walked into the suite, and shook Chin's hand.

"I am delighted, Mr. Chadwick. To what do I owe this honor?"

"I will not mince words," said Benson. "IBM, as you know, would like to receive both the exemption, and the contract to produce a generation of PTVs which can be driven on Asimov's surface. We believe we have the best technology available, and we are prepared to do whatever is necessary to convince whomever we need to that we should receive this contract."

"We are also familiar with the political pressure on you to award CIMMCO this contract by using the situation of our former Chairman's wrongdoing, though that is ancient history, and no one alive today, was even involved. Please understand, sir, that if CIMMCO were to be awarded this contract, IBM will have to call for a formal investigation of the SSEC, and I believe this could negatively reflect on you and your honorable Council. Perhaps, those putting pressure on you would understand how much damage this could cause them, as well? IBM wants to see the right thing done, and you are an honorable man. There is a strong possibility that CIMMCO can receive a small portion of the contract from us to make those sections of the PTVs that are their strength. Is there anything we can do to help?"

Benson was trying to minimize the effect of the Sands issue. He needed to make Chin aware that giving CIMMCO the whole contract would not be viewed favorably by anyone in the system. They just did not have the appropriate technology.

Chin was surprised at how much Benson knew. He was not aware that IBM knew he knew about the Sands situation, and he was shocked that they knew about the syndicate. He was totally unprepared, though he was relieved. Now, he could do the right thing for safety and the environment without causing any negative consequences. He also had what he needed to convince the syndicate that they would be in trouble if CIMMCO got the entire contract, yet could tell them CIMMCO could get a piece of the

action...one they could handle.

"Why, Mr. Chadwick. What makes you think there is a problem with the SSEC awarding the contract to IBM? We intend to give IBM the award today. I am so pleased you will be here to tell your chairman of our findings. Please come to our meeting. It is at 1400 this afternoon, here at the resort. Will you join me and some of the other Council members for some lunch?"

Benson smiled. His approach worked. Chin was an honorable man. The Council would give IBM the exemptions and contract they needed with no problems, and Chin would let the Chinese syndicate know the damage he was able to avoid on their behalf. It was truly the win-win situation Benson and Chin had hoped for.

After the meeting, Benson sent his holomessage.

"Kunisada-san. IBM has received the exemptions and contracts to prepare drivable PTVs on Asimov. All problems were averted.

"How did you persuade him, Chadwick-san?" Kunisada asked.

"Chin is an honorable gentleman." Benson explained. "I have learned in my studies of many cultures and organizations that the secret of diplomacy is making everyone satisfied with the final agreements.

"More than 2600 years ago, a Chinese philosopher Sun Tzu, wrote in a book called, *The Art of War*,

> 'If you know the enemy and you know yourself, you need not fear the result of a hundred battles. If you know yourself but not the enemy for every victory gained, you will suffer a defeat. But, if you know neither yourself, nor your enemy, you will succumb in every battle.'

"I knew about all the parties involved. And, I knew us. Perhaps, today, we should call Sun Tzu's philosophies, the art of peace."

"Chadwick-san," said Kunisada. You have a wonderful vacation with your

family. I want you to know that this situation could have been catastrophic to the company. Your courage and knowledge will not go unrewarded. When you return to work, you will find you have been promoted to Vice President. On behalf of the company, I congratulate you."

Benson knew it would be a great holiday!

Crisis On Asimov
About The Author

Dr. Sheila R. Ronis is President of The University Group, Inc., a management consulting firm, and think tank specializing in strategic management, national security and public policy. She is also an adjunct professor at the University of Detroit Mercy and Oakland University where she teaches "Strategic Management and Business Policy", "Managing the Global Firm" and "Issues of Globalization" in the MBA programs. She often lectures at the Industrial College of the Armed Forces (ICAF) at the National Defense University in Washington, D.C. and participates in their annual National Security Strategy Exercise. Her B.S. is in Physics and Mathematics. Her M.A. and Ph.D. are in Organizational Behavior and General Social Systems Theory from The Ohio State University.

Dr. Ronis founded and directed the Institute for Business and Community Services at The University of Detroit to assist the U.S. automobile industry in becoming globally competitive by bringing systems and strategic management principles to the industry.

Joining the University of Detroit from Ameritech Publishing, Inc., where she was a Strategic Planner, she worked at AT&T and Michigan Bell before that, helping the corporation during its divestiture years. Prior to her Bell System tenure, Dr. Ronis directed a national energy program for the U.S. Energy Research and Development Administration (ERDA - now the Department of Energy), in Oak Ridge, Tennessee and Washington, D.C. While an administrative associate at The Ohio State University, she chaired the Legislative Affairs Committee, acting as the legislative liaison between the University Senate, the Ohio General Assembly, the Governor's Office and the Ohio Board of Regents. Dr. Ronis began her career working at North American Rockwell in Columbus, Ohio.

Dr. Ronis has worked with many organizations; public, private, large, small, profit and nonprofit. These include: General Motors Corporation, Ford Motor Company, the Department of Defense, the Department of Energy, the Federal Laboratory Consortium For Technology Transfer, U.S. Institute of Peace, USAID, Ameritech, USCAR, the Interstate Commerce Commission, the Institute for National Strategic Studies at the National Defense University, the National Science Foundation, and The State Council of The People's Republic of China.

Dr. Ronis began working with the U.S. automotive industry in 1985. This included Ford Motor Company as well as several automotive suppliers. In 1988, she began working with the Cadillac organization at General Motors on helping to fix the Allanté two years after start of production. She then became involved in the Cadillac 2000 project on behalf of the Chief Engineer of Cadillac, Mr. Robert L. Dorn. In 1993, Dr. Ronis helped to revamp the General Motors corporate intelligence function. From 1994 to 1996, The University Group became a captive supplier to General Motors working on a number of corporate functions. Since that time, Dr. Ronis has continued to work with GM on a number of projects.

In 2000, Dr. Ronis was asked to assist the Ford Motor Company in improving its corporate intelligence function, and strategic visioning processes.

Dr. Ronis began working in the national security community during the divestiture years of the Bell System that included her participation in the decisions related to the security of the nation's telecommunications infrastructure.

For more than a decade, Dr. Ronis has been working directly with the U.S. Department of Defense and the national security community. Her first assignment was teaching "grand" strategy as it is viewed in global business to the Management Faculty at the U.S. Army War College in Carlisle, Pennsylvania. She was also involved in the development of the first Strategic Leadership Symposium at the Army War College under the command of Major General Paul G. Cerjan.

In 1993, Dr. Ronis began her work with the National Defense University (NDU) in Washington, D.C. She has played a role in bringing industrial knowledge of the transportation industry to the Industrial College of the Armed Forces (ICAF) and NDU and currently serves on the NDU Foundation Board of Directors as Vice President.

In 1996, Dr. Ronis was asked to deliver a paper on "National Security and the Theories of Dr. Deming" by the W. Edwards Deming Institute. The paper was read by General John M. Shalikashvili, Chairman of the Joint Chiefs of Staff and was widely distributed throughout the Pentagon as an example of applying strategic systems thinking to matters of national security.

At DoD, Dr. Ronis has worked with the Air Force Special Operations Forces at Robins Air Force Base and Wright Patterson Air Force Base, and the U.S. Army Tank-Automotive and Armaments Command (TACOM). She was asked to write a "white paper" about the need to define and retain Department of Defense core competencies and what happens when outsourcing occurs. At the Pentagon, she has worked in support of projects at the Office for the Secretary of Defense on visioning for the Department, and has supported the work of the Defense Reform Task Force. Her work for the Secretary of Defense included a written operational definition of the Revolution in Business Affairs that was used to support the Revolution in Military Affairs for the Quadrennial Defense Review in 1997. In addition, she was a team leader as a part of the "red team" that critiqued the Joint Vision 2010 work for the Joint Staff, J-7.

In the last few years, she has also supported the work of the Hart-Rudman Commission on U.S. National Security for the 21st Century.

Dr. Ronis has also worked on behalf of the economic and transportation elements of national security supporting the original work to create USCAR, the United States Consortium for Automotive Research, and its major initiative, the Partnership for a New Generation of Vehicles. In addition, she helped the Federal Laboratory Consortium for Technology Transfer (FLC) with a master plan and vision for the future. Her work with FLC included a paper on how national laboratories and scientific researchers can comply with the Government Performance Results Act (GPRA).

Known as a systems security strategist, Dr. Ronis has authored 142 papers. Her paper delivered at the Pentagon entitled, "Economic Security is National Security: A Discussion of Issues Surrounding the Global U.S. Corporation" suggested a way to re-think industrial base policy. Her paper presented at the U.S. Army War College, "Visioning for the 21st Century: A Process for National Security" outlined the way in which an interagency activity might produce a more holistic national security strategy for the United States. Her paper on "Shaping in the 21st Century" delivered at the Army's conference at the Walker Institute of International Studies examined the new roles that the Department of Defense would need to play in the Post Cold War era. Recently, she supported the

work of the Department of Commerce Office of Strategic Industries and Economic Security with a study of the U.S. Army's Theater Support Vessel released in December, 2003.

Dr. Ronis also has published the scenario "Crisis on Asimov" in *Automotive Industries* Magazine, and the *Financial Times Automotive World,* in London that is a strategic futurist's look at transportation in the world of 2085 that uses a Department of Defense visioning process. In addition, Dr. Ronis worked with the late Dr. W. Edwards Deming including co-authoring the paper "Preparing Cadillac for the 21st Century: Systems and Strategic Thinking." Dr. Ronis is Vice President of the Board of the National Defense University Foundation and also sits on the Board of Directors of the Detroit Institute of Ophthalmology (DIO). She is the former Vice Chairman of The Ohio State University Alumni Association. She is a former board member and life member of The Economic Club of Detroit. She is a life member of the National Defense Industrial Association (NDIA), and the Association of the U.S. Army. She is a member of the Defense Orientation Conference Association. She is also a life member of the Phi Kappa Phi Honor Society. Dr. Ronis is a frequent guest on the NBC affiliate in Detroit and several other Detroit area TV and radio news programs. She writes for the NDIA publication, *National Defense* regularly and publishes articles on-line from time to time at HYPERLINK "http://www.emotionreports.com" www.emotionreports.com.

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