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I Learned the Few Most Important Lessons of My Life in 5 Minutes or Less

By Jackson Ito

It doesn't take long to learn important lessons in life. What is critical, however, is to be able to recognize what is important and build your life around those principles. Let me give you a few important lessons that I learned which changed my life.

Overcome my Fear of Speaking in Public

Throughout elementary school, high school, and even until my senior year in college, I was always afraid to stand and speak in front of my classmates. Even during class discussions, when the teacher asked the students a question about our lessons, I never raised my hand even though I knew the answer, if anyone else could answer the question. My teachers were often aware of this, so when nobody in the class knew the answer, they would ask me. I did not mind answering questions from my desk, but not in front of my classmates.

This all changed completely my last year in college. In preparation for graduation, it was mandatory to take a public speaking class. What completely changed my life was when my professor told us that after graduation and as we progressed in our careers, we would be expected to make presentations about our research in front of large audiences. It is often common practice in the U.S. that when speakers are introduced to the audience before the lecture, the speaker would thank the chairman for the introduction and thank the audience for coming to hear the speech. The professor told us to ***NEVER, NEVER*** thank the audience for coming to hear us speak. On the contrary, we were going to inform the audience of something they did not know, so the audience should be thanking the speakers for taking the time to come and share their knowledge. This changed my outlook from one of inferiority complex, to one of superiority complex. This message only took less than one minute to deliver, but it changed my life forever.

In 1990, I attended an International Conference on Rocket Combustion Analyses and Design, which was held in Paris in conjunction with the Paris Air Show. Although I had written very few technical reports and rarely attended these conferences, one of the conference co-chairmen was someone whom I had worked with at Aerojet before he went back to obtain his Ph.D. and became head of the Propulsion Department at Purdue University, a highly regarded rocket engineering university in the U.S. Because he personally knew me and knew of my capabilities, he asked me to be the first of 23 speakers to relate the research of the remaining 22 speakers to follow me on how to integrate their research to the conference goals. I mentioned to my sister who was visiting me at the time, that I would speak for 30 minutes followed by a 10-minute question-and-answer period.

She asked me, “What are you going to do, if they ask you a question you do not know the answer to?”

I replied, “If I don’t know the answer, I know that nobody else in the audience knows the answer either, but I could tell them what they need to do to set up a research project to find the answer, and I could give them an estimate of how many years it might take to find the answer and how much such a research program might cost.”

I would never have had the confidence to make such a statement, if it had not been for my **one-minute lesson** from my speech professor.

A Five-Minute Lesson on How to Solve a Nobel Prize Problem

Although I attended an excellent university, I only graduated with the lowest (Bachelor of Science) undergraduate degree. I did not go to graduate school to earn either a Masters Degree or a Doctoral Ph.D. There must have been at least six Nobel Prize winners at Caltech while I was there. One of the Nobel prize winners was Dr. Richard Feynman. He used to enjoy meeting and talking to the undergraduates, because he said the future of the world’s science was in the hands of the very small, but brilliant (about 700 to 800) undergraduate students at that time. By now (50 years later) it is a little larger, about 900 to 1100 students. The rest of the Nobel Prize winners would primarily associate with their faculty colleagues, a few graduate students they were advising on their research or other post-graduate researchers in their field.

Dr. Feynman was highly knowledgeable over a wide variety of fields besides his own specialty of Theoretical Physics. He would usually entertain us with his amusing experiences during various situations in his life. However, on one occasion, a student asked him a very serious question, "***Dr. Feynman, how does one conceive of solutions to problems that are so complex to merit winning a Nobel Prize?"*** This was only one of a very few occasions when he became very serious.

He replied, "No matter what field of science you are in, there will be about 100 differential equations which will have some bearing upon your problem. In some fields, there may only be 70 equations, while in other fields, there may be 200. However, if this is your field of interest, you will know which third of the equations will be most critical for solving your problem, which third of the equations are relatively easy to solve, but which will be needed to calculate input data for the other equations, and which third falls in between. You must begin by solving one of the equations in the most important category. As soon as you begin this task, you will realize that you have no data to use in your equation. However, again if this is your field of expertise, you will have some idea what a reasonable numerical value might be. Use that value and solve for your answer. If your answer is reasonable, keep that guessed value until you come up with a better estimate later. If your answer is totally illogical, pick another number and repeat your calculation until you obtain a reasonable answer. Then, you can move on to your second most important equation and repeat the process. As you continue working your way down your list, at some point you will obtain a solution which corroborates one of your earlier solutions. Beyond that point, the equations will start to fall in place like a puzzle and your rate of understanding will accelerate. Finally, at one point you will say ***'Ah HA!'*** At that instant, you will be the first and only person in the entire world that knows the solution to the problem everyone else had been searching for.

This is exactly the procedure I followed on all of my rocket engineering problems. However, instead of merely guessing what my input data should be, I prayed for guidance from *Benzaiten, O Fudo Myo* deities, my Guardian Angel and others for inspiration. I used Dr. Feynman's method to solve one of the most difficult and critical problems in rocket engineering. It took me nine years from 1963 until 1972 before I understood my problem. At that point, I knew that I had completed my thesis for a Ph.D. degree that nobody else had ever been able to solve. Although this path required nine years of off-and-on investigation built around my other normal job responsibilities and family, instead of three years minimum of graduate study, I knew that I had earned (with God's help) a self-taught Ph.D. based only upon Dr. Feynman's five-minute lesson.

Whenever my managers received a problem with no previously known methods of solution, they always gave it to me because they knew that if anyone could solve it, I would be best at it.

On one occasion, after solving a particularly difficult project, after I finished my presentation to our customer, their technical manager commented, "You must have a Ph.D. in Physical Chemistry. In fact, I had not even taken an undergraduate course in Physical Chemistry.

That is how useful Dr. Feynman's five-minute discussion had on my rocket career.

Comparing Science vs. Religion

In the U.S., there are two separate groups who call themselves either **EVOLUTIONISTS** or **CREATIONISTS.** Most people are Evolutionists and believe the scientific evidence in which Charles Darwin predicted both animal and plant life change over generations to adapt best to their environment. However, there is a small but vocal religious Christian minority, who literally believe everything in the Bible – God Cceated everything as it exists today from the very beginning of time. This creates a dilemma between differences in viewpoint between science and religion.

After my mother reported to Bishop Kishida that I had been accepted for college at the California Institute of Technology (Caltech), he asked me to come over so he could give me some advice. First, he congratulated me on my acceptance to Caltech. He commented that Caltech was an excellent college, where I would learn a great deal about science. He said that if I could combine what I learned about science from Caltech together with what I learned spiritually from Gedatsu, that would make an unbeatable combination. Then he told me that the goals of both science and religion are identical. Both seek to understand the universe as well as our own immediate surroundings. However, their approaches are totally different. Science will not believe anything unless it is repeatedly proven and supported by **DATA**. Religion requires no data or proof. All it requires is **FAITH**.

In 1959 Bishop Kishida predicted that as "scientific measurement techniques" improved, the paths of science and religion will converge rather than being on two parallel but separate paths.

In our Declaration of Creed Prayer, under Five Articles of Faith, we acknowledge ***"Our Assertion of Truth is the Unity of the Visible and Invisible Worlds."*** In the earlier days of my Gedatsu study, I thought it was only in reference to the physical and spiritual worlds. However, as my understanding of science increased, I realized that there is a vast amount of the physical world which is also invisible. Let me give you examples of two extremes.

On the one hand, astronomers using the largest and best earth-based telescopes noticed that there is one region of the sky which seems empty of any galaxies. So they pointed the space-based Hubble Telescope toward this region to verify that it was empty. Scientists were astounded to find that this region, previously thought to be empty was filled with numerous galaxies. Therefore, if the same density of galaxies within this small region were representative of the entire universe, there was estimated to be (I think the number was) 500 billion galaxies in the universe. Each galaxy probably contains billions of stars such as our sun. Each star may contain a number of planets surrounding them such as within our solar system, all of which are "invisible" to us. When Caltech's radio telescope laboratory was situated in the Owens Valley, California, I had an opportunity to take a tour of it. It receives signals which have been travelling at the speed of light for 14 billion years. They have at least 20 or more dishes which look like radar screens which are about 10 to 15 meters in diameter. Each dish is on a track and can be moved around over a grid which is about 1 kilometer in diameter. The reason for this is that separate dishes spread out over a 1 kilometer distance looks like a single dish that is 1 kilometer in diameter, if the signals between them can be co-ordinated simultaneously. Since all dishes send their signals to a central data collection center, the signals from the closer dishes have to splice in additional fiber optic cable so that the cable length is exactly the same length as the farthest dish from the data center. When you compare the time difference it takes light to travel less than 1/2 km compared to 14 billion years, you can realize how sophisticated "scientific measurement techniques" have become. By the way, there are other kinds of telescopes which are located at different positions on the earth to make it look like a single telescopic lens which is as large as the diameter of the earth.

The other extreme of the "invisible" physical world is on the molecular, or even subatomic, scale. Everyone is already aware of the vast amount of biological research which has evolved over the last 15 to 20 years starting with the Human Genome Project to study DNA and its application to biological research.

About two years ago, I had the opportunity to accompany Caltech to Cern, Switzerland to tour the Super Collider, while it had been temporarily de-activated to upgrade its power to conduct still more advanced research experiments. The Cern Super Collider was set up by a consortium of European nations, which was established to prevent the "brain drain" of their best scientific talent moving to the U.S. due to lack of adequate advanced research opportunities in Europe. The U.S. is not a member of the consortium and does not contribute to the upkeep and operation of Cern. However, the U.S. contributes the second most researchers at Cern as technical advisors due to the most highly advanced theoretical physicists residing in the U.S. The U.S. institutions sponsoring these scientists (including Caltech) pay their salaries and they are not compensated by the European consortium.

At Cern, they separate the hydrogen electron from the hydrogen atom to produce a pure proton only. These single protons are sent into a series of circular paths in which the protons are accelerated.   Then, after reaching a certain speed, they are passed on through intersecting circular paths to higher energy level circuits until it reaches the final circuit. By the time these protons enter this final circuit, they are travelling at 0.9999999 times the speed of light. By Einstein's Theory of Relativity, these single protons have the equivalent mass of approximately 3000 protons at rest. Within this final path, there are two circuits side by side, but the electrons are traveling in opposite directions. Occasionally, these two counter rotating paths cross each other and there is a possibility of collision.

My simplistic explanation is that this is an "anti- atomic bomb." In the atomic bomb, uranium or plutonium is divided and a very small amount of mass is consumed to create a massive release of energy. At Cern, a massive series of electro magnets are set up to place a negative charge in front of the proton to pull it forward. As soon as the proton passes, it is reversed in polarity to create a positive charge to push it from behind. It requires enormous amounts of electrical energy, highly coordinated, to move a proton travelling very nearly at the speed of light. When these two highly energized protons collide, they **CREATE MASS.**

When I visited the Cern facility, they had just detected the Higgs-Bosun sub-particle, which had been predicted by Einstein's Theory of Relativity, but had never been detected before. Everyone was very excited and elated. In order to detect this particle, they had to collect enough data around the collision site to measure the Higgs-Bosun, which was likewise travelling at the speed of light at about one-meter increments. You can just imagine how much data had to be collected and to find the exact path the particle was travelling to prove its creation and existence. Where did the Higgs-Bosun go? You cannot catch a Higgs-Bosun and collect it in a jar like you would other forms of matter. It was only in existence for a very short life and dissipated as a consumption of energy. I only bring this subject up as another example of Bishop Kishida's predicted improvement in "scientific measurement technique."

We Gedatsu members know that spirits exist. Therefore, just as it required some time before "scientific measurement techniques" could be developed to prove the existence of the Higgs-Bosun particle predicted by Einstein's Theory of Relativity, and its short life span, it was eventually proven to exist. Although Bishop Kishida did not say so explicitly, I think it was his expectation that in time, "scientific measurement techniques" could be developed to detect the existence of spirits. Then, the parallel universe of the Evolutionists and Creationists will have to converge.

This brief discussion between Bishop Kishida and myself before departing for college only took **three minutes** but it set the compass for the rest of my life.