

Growth from loving Jeju Island Remembering Father Emile Taquet (1873-1952)

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Abstract

I respect my hometown Jeju as a story. I believe that storytelling is the most radical and accessible approach available to organize our memories, the events of our day, dreams of possibilities and hope for what can be. By telling our stories and reflecting imaginatively on our lives, our ancestral roots and our relationship to the land, we discover powerful memories of nature in our childhood or of selfless parent. I liked to listen to a story of Father Emile Taquet from my grandfather and my father and I also was able to replicate his great work in Jeju.

He was always frugal as a lifelong botanist and as a seminary professor. He experienced the agony of the age since he experienced the Jeju Uprising aftermath, Japanese colonial period, the First and Second World Wars, Korean War, and the nuclear bomb in Japan. He always shaved his hair off because of his poverty. He was always frugal as a botanical collector. Because of its geological make up many people in Jeju suffered damage caused by the force of nature every year. He developed tangerine orange cultivation and he taught people how to break the poverty cycle of their lives. He was the real social leader as well as a parish priest. He recognized that local people had their expression of their own faith. By recognizing each area's culture and tradition, he was able to have a good relationship with Jeju people for 13 years. He taught Jeju people how to boost the economy by direct action in their own eco system.

He never hurt their pride even though they lived poorly. He collected plants and worked as a professor, and completed his missionary work. He passed away in Daegu on January 27, 1952. Before and after the Korean War, he spent his last days helping the development of home for orphaned children.

Key words :

Jeju Island, Halla Mountain, Amorization, Collection of plants, King Cherry Blossom, Microbes, Relationship with God.

Chapter 1 Amorization of Father Emile Taquet

One sentence that particularly struck me from my doctoral advisor physicist Brian Thomas Swimm's class on Teilhard de Chardin was our discussion on the way in which we are transformed into Omega as the process of becoming love – in other words "Amorization". (de Chardin, 1999, 262–265) This word is the main focus of my study.

The Jeju people love nature because it provides them with the fresh air we need to cleanse ourselves from the dirty contaminated air which is full of sin. Those who are sensitive to this sinful and dirty air are longing for the nature to help them to breathe again. Therefore, I would select community of brave prophetic people to live in the wilderness no running water, or anything that a modernized and civilized community would have because they love nature. These people are considered pioneers. They gave up their lives in devotion to cleaning this world of sins because I believe that they believe nature won't lie like humans do. I think all our efforts, for example, JPIC (Justice, Peace, Integrity of Creation) movement, Permaculture, Pachamama, and eco-park are good examples for ecological movement in this present time.

Two John's in Jesus' life:

As a Catholic priest, I have believed that there are two John's in Jesus' life who show these two qualities. There is John the Baptist and John the beloved. The church often speaks of John the beloved, and preaches about God's merciful embrace as shown in the father's right hand in the Rembrandt painting. However, the church stays away from focusing on John the Baptist, the wild prophet. We all know of how it ended for John the Baptist, as well as most other prophets, but if the institution of the Church is truly supposed to have Christ's mission, then how could it fear such prophetic people, and how can it silence those who authentically bring their experience of God into dialogue? Fortunately, today, many people have found the wisdom that is expected to be a vision for the future. Here we can meet a great prophet Fr. Emile Taquet. He was trained in the Paris Foreign Missions Society, but held a career as a distinguished Botanist. He was very concerned with finding a way to dissolve the gap between spirituality and secularism here in Hongro, and therefore worked out a role for a missionary approach that integrates his creative work on the outside and inside of the Church. He everyday reflected to create a dynamic integration between his spiritual life and collection of plants on the Halla

Mountain. He found integrity to be mutually enhancing between men and plants, that is amorization. For 30 years in Daegu seminary, his example inspired many young seminarians including Cardinal Kim Suhwan (1922–2009).

Influence:

I think Father Emile Taquet was influenced very much by the theory of evolution by natural selection, first formulated in Charles Darwin (1809–1882)'s book "On the Origin of Species" in 1859 and the science of genetics of Gregor Mendel (1822–1884, Austrian Catholic Augustinian priest). Also he was familiar with French Jesuit Father and paleontologist De Chardin. Also another influence on Father Emile Taquet was the example of Father Urbain Faurie (1847–1917, French Missionary priest), Between 1906–1913, Father Emile Taquet and Father Urbain Faurie cooperated in the botanical collection. "the pictorial book of the plants (Father Faurie's produce books in many museums) helped me a lot in the plants collection." (a letter to Bishop Gustave Mutel in 1907)

Bibliography of Taquet:

Father Taquet was born in Hecq in 1873, and spent his early years surrounded by the natural beauty of his Southern France home. His early experience and love for Hecq was his early lesson in life's important lessons and planted the seeds for his dedication to God's love. He graduated from the Seminary of the Paris Foreign Missions Society and was ordained in 1897, in which year he left France for Asia. Based in Jeju, Korea, he was responsible for missionary work on Southern area of Jeju Island. Deeply moved by the Jeju Uprising and other crises during his life, he moved from pastoral work into the plant collections, and finally Seminary training of priest aspirants. Alongside this work he indulged his passion for botany, making large collections of specimens to forward to European museums. Taquet discovered a great many species new to science and many are named in his honour, such as *Dryopteris taquetii* Christ and *Rosa taquetii* H.Lév. (<https://plants.jstor.org/Taquet,EmileJoseph.html> 2019. 4.2)

On April 14, 1908, Father Taquet climbed 600 meters up Halla Mountain to the Gwaneum Buddhist Temple and collected a flower from a cherry blossom tree during collecting date between 1906 and 1913. This specimen, Cherry Blossom Tree No. 4638 became the first specimen collected from a King Cherry Tree and meant that Jeju became known as the home of the King Cherry Tree. At Emile Taquet Forum in 2018, botanist Kim Chansoo explained that it was a forest behind the Gwaneum Buddhist Temple (about

600m a.s.l) in Northern slope of Halla Mountain of Jeju Island (Father Emile J. Taquet, No. 4638, 1908. 4.15). Identified as 1 variety of *P. yedoensis* by Dr. Kohne from University of Berlin (1912). Koidzumi, Takenaka, and Nakai supported that Jeju Island is its natural habitat. A corroborative sample by Doctor Kim Chansoo, KOREA: Quelpaert Island, Hallai-san, alt, 1000–1900meters, October 31, November 5, 1917, E. H. Wilson (Nos. 9486, type, 9486a); same locality, May, June, July, August, 1907, U, Faurei (Nos. 1517, 1518, 1519, 1520, 1522); same locality, June, July, 1909, Emile Taquet (Nos. 3263, 3265, 3266); prove South Keisho, Chiri-san, alt. 1000–1840 meters, November 16, 1917, E. H. Wilson (No. 9602). (Emile Taquet Jeju Forum November, 23, 2018)

My own story:

The land that God had created may have been used in various forms but the Land of Jeju Island is special because it is the nesting place of rare migrating birds and the co-habitat of various species of plants. There also co-exist many different religions from Shamanism to Roman Catholicism. At Hongro I received my Catholic faith from my family and the elders of the village. My faith in Catholic Church is one of many that formed me, however, my friends know me as being playful, adventurous, and compassionate. I have fond memories of childhood when I used to play at the streams catching frogs and taking a long stroll through the town to watch the market that happened every five days in the village square. I enjoyed seeing different products and colorful merchandise being traded in the market place. I think what I enjoyed the most was watching the faces of people as they meet and share their life stories with one another.

DNA of becoming Catholic priest:

My grandfather entered the seminary in 1917 and his spiritual guide Father Emile Taquet cried the tears of joy. When he was a parish priest my grandfather was born and baptized by him. But my grandfather quit the school because he got a lung disease. Then, seminary experience of my grandfather was repeatedly when my father attended the seminary school in Gwangju in early March of 1956. A Catholic parish priest Patricio Han (Missionary Society of Saint Columban) was a spiritual guide for my father. My grandfather became the greatest advocate for my father's vocation, but my father also dropped from the school after graduation from the minor seminary. I remember the day I called my father, also a farmer, doing hard labor, to tell him the news of my entrance to seminary school and he also cried tears of joy. I entered the seminary in 1990. My parents started, then, to plan for my future as a

priest. As a seminarian, my parents and myself went up into the mountain for forty days, to pray to the Lord and to sing our praises. Being one with nature and being under the sky that I so loved, it was an unforgettable winter where I spent forty days. This was January in the year of 1990. And a few years later, I heard from my relatives about the vocation story of three generations of Huh family and it was grandfather's Memorial Day.

My Matrix Hongro:

I lived next to the monastery (named Clerical Congregation of the Blessed Korean Martyrs, built in 1959). Nearby there was also a bamboo grove. Curiosity always got the best of me, so on my way to the monastery; I would always make a detour into the bamboo grove. There I would meet up with the snakes and get bitten by mosquitoes. These memories give me comfort. In our town, there is a brook called Ji-Jang creek (it means the creek of wisdom). There, the creek is so cold that it could freeze blood. The older people have many memories about their childhood, especially in regards to the flowing water. For the sake of their memory, we have worked to preserve this stream. There I also found all my friends. I played with the frogs, fishes, salamanders and the birds. In the mountains, if I look up to the sky, I could always find the big dipper. The ability to recognize and to name the constellation was a talent of mine and because of this I have received comments and praises by the villagers. Sometimes, sitting upon a hut in the middle of the field, I can see a whole constellation and shooting stars. In the mind of a boy, this was the whole world. On this Halla Mountain, this was my entire world. It was hard to imagine anything beyond this mountain. My eyes have never seen the wide sea. One of the most memorable events in my childhood was the day that I climbed up the Halla Mountain for the first time. I might have been nine or ten. The hike was long and strenuous. I could have given up if it wasn't with the help of some kind Buddhist monk. When I got up to the top of the mountain, I was blown away by the awesome spectacle! The panoramic view of my beautiful Jeju unfolded before my eyes. Up until that time, my village had been the entire universe to me. The view from the peak of Halla Mountain that day had opened my eyes to the whole new world for New-Amorization. I see similarity between my early days and those of Father Emile Taquet.

Father Emile Taquet's Matrix:

I easily could imagine, as a foreign missionary, his journey was filled with his friends from the forest. His best friends were wild flowers like Cherry Blossom

Tree No. 4638, Korean Fir, *Adenophora taquetii* H. Lév., *Carex taquetii* H.Lév., *Aneilema taquetii* H.Lév., *Allium taquetii* H.Lév. & Vaniot, *Silene taquetii* H. Lév., *Rhamnus taquetii* H.Lév., *Rosa taquetii* H.Lév., *Saussurea taquetii* H.Lév. & Vaniot etc which he collected around Halla Mountain, a ground beetle, a lawn, a ladybug, gold bug, fireflies, cedar wood, bamboo grove, the Big Dipper and so on. Up until middle of 1910s this was what filled the pages of his journal. So, I ask him this question. Being so close to nature, how could you have separated yourself from the nature that you so loved? He couldn't separate himself from all that he loved in nature.

Two de-amorization events

First, the Jeju uprising:

According to Father Jerry Cotter (Missionary Society of Saint Columban, a retired Catholic Priest who has lived in Korea since 1955) explained the early Catholic Church of Cheju like:

Between 1871 and 1900, Korea experienced relative freedom of religion. Jeju by then had three Catholic churches, two in Jeju City and one in Seogwipo, several French priests, and the faith was gaining new converts. Then the Lee Jae Su uprising occurred. "It wasn't country-wide," Cotter said, "but only in Jeju in 1901. This was a persecution not instituted by the government, but an uprising against the very unfair taxes the government was imposing here." ([http://www.jejuweekly.com//2014/03/15/Catholicism comes to Jeju.html](http://www.jejuweekly.com//2014/03/15/Catholicism%20comes%20to%20Jeju.html) 2019.3.30)

Second, April Third Event:

The Jeju Island also again suffered great Genocide on April 3, 1948 and lasting six months. Although it was caused by the conflict of ideology, communism vs. democracy, the majority of victims were innocent women, the elders, and children who had nothing to do with it. Many people fled the ideology and ran toward the mountains. They were labeled communist spies and with the aim of killing them, the mountains were set on fire, suffocating those hiding in caves. As a result, not only people, but also caves, soil, mountains, and plants were all destroyed. Only our consciousness survived to testify our history. As time passed, the Jeju people began to rebuild their lives centered around the coast, cultivating tangerines and stemmed plants which are resistant against typhoons, sea water and the volcanic island's acid soil. There have been divisions among people and the nature has been destroyed. Unfortunately, history is repeating itself. There is urgent call for people of faith to step up and protest against this dark force from destroying people and nature of Jeju Island.

Conclusion of Chapter 1

Jeju people, including myself, express their unique views in the events and traditions of their times, so we can realize their special cultural and historical contexts. These people meditate on Absolute Being from unique view point and charisma, and a discernment method with which to express the existence of Holy Spirit in daily life in their communities. Father Emile Taquet sought for that which is based on mission spirituality, the discovery of the plants, and the experience of prayer and events in daily life of living with the Lord. I believe that this is unique evangelization for the vulnerable people and plants of Jeju.

Chapter 2 Teaming with Microbes

French Catholic priest de Chardin's concepts help us to understand our original intimacy with nature. Our home, Jeju, is like our mother's womb. Jeju Island embraces each of us to share in the suffering of nature. Home is comfortable, mutual, and symbiotic. This, in connection with Father Emile Taquet's understanding, will inspire us to desire communion with nature – all creation, both human and non-human. Father Emile Taquet lived by the biblical and biological principle of yesterday, today, and forevermore. He believed that we should become one within amorization from the past and into the future, and eventually, we will meet with Christ. He said that Christ is the Lord of yesterday, today, and forevermore.

Hope for the next generation:

Here in Chapter 2, I want to give the elderly their childhood and past, the present people new cosmology and soil science, and the children hope for the future. For these reasons, the parish and I built an eco-park. Jeju Island as a whole is a music center of beauty. Here at Jeju we stretch our imagination to contemplate environmental questions. 'What is our role and responsibility within this awesome beauty? We have to be well-developed citizens of harmony, balance, and peace. Jeju People whose imaginations perceive a world of Jeju Island-Justice and who hope for a better world for the children of every species including human.

I remembered this confession of de Chardin, "Since once again, Lord – though this time not in the forests of the Aisne but in the steppes of Asia – I have neither bread, nor wine, nor altar, I will raise myself beyond these symbols, up to the pure majesty of the real itself; I, your priest, will make the whole earth my altar and on it will offer you all

the labors and sufferings of the world... I will place on my paten, O God, the harvest to be won by this renewal of labour. Into my chalice I shall pour all the sap which is to be pressed out this day from the earth's fruits." (de Chardin, 1965, 19) I believe that Father Taquet also celebrated it on the Halla Mountain every time like Father de Chardin.

I believe that Jeju Island is a whole Eco Park which is one suggestion to rediscover Jeju Island. In our parish, there are many kindergarteners. So, I made an ecological park so that our children can have hope about their future. Wrapping up the organic farming and New Cosmology course at the Genesis Farm in New Jersey, I presented Teaming with Microbes with the science of chemistry professor Larry Edwards. He attend several programs at Genesis Farm. (<http://www.walkthroughtime.org/team> 2019.3.25)

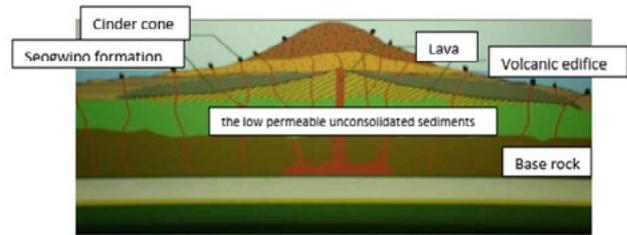
Soil in Jeju Island

Jeju volcanic Island formation:

My hometown Jeju Island is located at the end of the Eurasian continent. It is separated from the Korean peninsula and has a unique look due to age old weathering. Jeju Island's volcanic activity began during the Cenozoic era (approximately 1.8 million years ago up to the present time) when the first sapiens arrived. Around that time, due to the alternation of a glacial epoch and an interglacial epoch, the surface of the sea rose and fell by 130m repetitively. The southern sea, before the formation of Jeju Island, was a vast plain area during a glacial epoch and a continental shelf with shelf depth of 100m during an interglacial epoch.

The radioactive elements within Earth provided the heat for the volcanic explosions leading to the atmosphere and the seas and raising the continents above the waters. Volcanic activity on Jeju Island started with hydro volcanic activity and lasted for more than one million years. As a result, under the lava plateau of the island, a myriad of tuff ring and tuff cone stacked multiple layers. Huge amounts of ash were deposited on land and sea which formed a stratum, The Seogwipo Formation, 73,000 to 41,000 years ago. Due to the accumulation of lava on the Seogwipo formation from the hydro volcanic activity, the general sea level of Jeju grew higher than the current sea level (50 to 60 m). The island became high enough to be above the water even during the interglacial epoch. The hydro volcanic activity reduced gradually and lava flows began to occur predominantly in the mid Pleistocene epoch (approximately 40,000 to 80,000 years ago). All

the lava erupted over this period accumulated and slowly formed a vast lava plateau. This influenced the ecology.



(Source: Jeju cultural museum (<http://jeju.museum.go.kr/prehisotry0301.html> 2019.3.20))

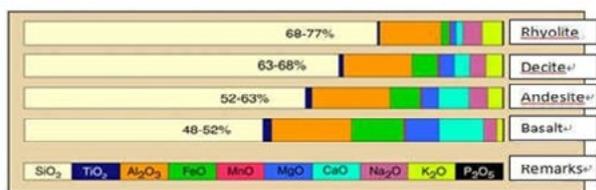
The volcanic soil:

When a volcano explodes, the lava flows thru a crater and turns to basalt when hardened. Minerals that make up soil and rocks are referred to as Aluminosilicate. We can infer that the land is not soluble in water, which means that Aluminosilicate is insoluble in water. Even though the unique structures of silicon oxide and aluminum oxide crystals enable the rocks and the soil to resist against being constantly washed and beaten by water and weathering, the solid crystal rock still erodes because of presence of impurities in the crystals. That is how the rocks can be broken down to clay minerals and plants can obtain several essential trace elements from the soils. This world truly is exquisitely crafted. The black-colored soil commonly found in Jeju was formed from basalt, the hardened lava, which was flung during the volcano explosion. Even though the soil is developed from the same basic basalt rock, it can become acidic when it is washed by the rain and loses cation of the alkaline soils thru that process. The acidity is determined by the pH of a mixture of water and soil in the ratio 1:1. Topsoil typically shows acidic with pH 4.7 and pH of subsoil is elevated up to 5.9 or 6.0.

First, black volcanic ash soil is used many different ways in the field, grasslands, and forests. Second, dark brown volcano ash soil is utilized for farming and characterized by less thickness compared to black soil, dark brown or brown, medium soil fertility, high acidity, and clay loam. Third, hill areas volcanic ash soil is non-crystallic volcanic ash soil with thin layers. It is characterized by its dark brown color and its unstable structure. It is scattered on the slopes of Halla Mountain. Finally, non-volcanic ash soil in Jeju can be classified into 27 different types. The characteristics of the soil are directly related to agriculture. Different types of organic plants have resistance to acidic soil in different

degrees. As time goes by, the soils become more and more acidic. To utilize acidic soils, it would be necessary to make a prudent decision on the selection of crops. Considering Green Chemistry, an enzymatic or a biological approach would be essential for optimal management, which includes proper management of nitrogen and phosphate. It also could be the subject of special interest and a key to soil science in Jeju Island.

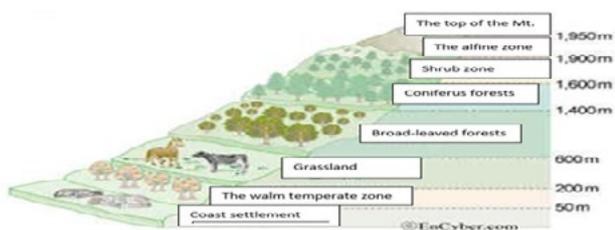
(source: <http://volcanoes.usgs.gov/Products/Pglossary/VolRocks.html>. 2019.04.01)



<Diagram 1. Many rock chemical characteristics>

Soil color	pH (1:1)	OM (g/Kg)	CEC (cmol/kg)	P2O5 (mg/kg)	phosphorus absorption coefficient (mg/100g)	Bulk density (g/cc)	3		
							solid	liquefied	gas
Black volcanic ash soil	4.3	210	41	22	2,806	0.63	23.8	52.1	24.1
Dark-brown volcanic ash soil	5.7	63	17	41	1,012	0.80	30.2	31.5	38.3
Non-volcanic ash soil	6.6	17	8	58	1,000	1.33	50.2	28.0	21.8

<Diagram 2. Volcanic ash soil characteristic>



<Cross-sectional diagram of Jeju>

Cherry blossom trees and good soil:

It should be placed in a sheltered location with full sun, in soil that is deep, fertile and moist, but well drained. They do best in soil that is deep and acidic. They are also sensitive to gaps in the soil that could let cold air seep in during the winter. (<https://homeguides.sfgate.com/soil-planting-cherry-tree-53079.html> 2019.4.3)

According to Doctor Kim Chansoo, endangered

plant thirty three individual which showed various growth habitats of *Prunus yedoensis* Matsumura were found to grow on Halla Mountain. They are generally growing in the region of 450m to 850m altitude, where temperate deciduous broad-leaved forests have developed. Morphological variation on 18 percent of characters in flowers, leaves, fruits, and seeds showed that most characters of native individuals were smaller in the size than those of cultivated ones although the limits of variation of the characters were somewhat wide in the native ones. (Emile Taquet Jeju Forum – November, 23, 2018)

Healthy living soil:

I approached the formation process of Jeju, its volcanic soil conditions on which is based on the science of soil. For the volcanic island, the annual typhoon and history of genocide are its fundamental realities. This Jeju history, the climate, and soil are all part of the stress and exhaustion suffered by the ecosystem, even for the invisible microbes.

Now I will approach the idea of how the soil lives and breathes, as based on fundamental science. This part addresses what Teaming with Microbes says about gardening, in particular how Jeju’s farming is not merely done for the sake of gardening but for the sake of Jeju Island itself. Healthy living soil in very simple terms is the ability to support plant life, while unhealthy soil does not support plant life. In good soil, we can find an abundance of life: earthworms, ants, slugs, centipedes, springtails, and more. All the life in the soil interacts together into what is termed the soil food web.

Why should farmers/gardeners know about soil food webs?

It is very important for farmers and gardeners to know about the state of their soil and how the soil food webs’ work because they can better manage their own soil by using techniques that will reduce – or possibly – eliminate the need for fertilizers, herbicides, fungicides, and pesticides. Our plants will be getting nutrients in the form each particular plant wants and needs so they will be less stressed. We will have natural disease prevention, protection, and suppression. The organisms in the soil food web will do most of the work of maintaining plant health. Billions of living organisms will be continuously at work throughout the year, doing the heavy chores, providing nutrients to plants building defense systems against pests and diseases, loosening soil and increasing drainage, providing

necessary pathways for oxygen and carbon dioxide. A notable worm population is a clear sign of a healthy food web community. It means organic matter, bacteria, fungi, protozoa and nematodes –all necessary to support a worm population – are in place. With these at the base, chances are the other parts of the soil food web are in order as well. Over the years the concepts and understanding of the importance of the soils' physical and chemical properties have been well accepted. However, it has not been until recently that the importance of understanding soil biology and biological properties has become a focus. It has been even more recent that researchers and growers have begun trying to manage the soil in a way to improve its biological properties. This is interesting questions. If we could shrink down small enough to enter into an earthworm burrow, smaller still to squeeze through the spaces between granules of soil, small enough to sit on a piece of silt that forms of life would we see? What would they be doing? Who would be eating whom? In this chapter we are going to do just that. We can take a closer look at who is at home in the soil.

This food web shows who eats whom in and on the soil. With organic matter as the initial primary food source, the bacteria, fungi, actinomycetes and nematodes in the food web feed and release nutrients for plant uptake. Then they themselves are fed upon by larger soil organisms such as arthropods, earthworms and so forth.

Soil organisms come in a great variety of sizes: in *Teaming with Microbes* (Jeff Lowenfels, 2010)

Macro or large organisms are those with a diameter greater than about 2 mm (1/10 in). They are easily visible to the human eye. Examples would include earthworms, plant roots (yes, plant roots are soil organisms), mice, voles, snakes, beetles, and millipedes to name a few.

Meso are the mid-sized organisms that range from about 2 mm down to 0.2 mm in diameter. These include mites, springtails, and smaller worms. Some of these critters are visible to the naked eye, but many of them are difficult to see without some magnification.

Finally, the micros are the small ones. These are less than 0.2 mm in diameter. In general, these can only be seen using microscopes, though large masses of fungal filaments can sometimes be seen. In fact, some scientists claim a single soil fungus that is spread over many acres in Michigan's Upper Peninsula is actually the largest living organism

in the world. Most of these organisms are truly miniscule such as the yeasts, actinomycetes, algae, and bacteria. Bacteria, for example, range from 0.5 to 5 um (1/50,000 to 1/5,000 in) in diameter. To put that into perspective, about 4,000 of the smaller bacteria could line up head to tail across the head of a pin. Of course bacteria have neither heads nor tails.

The focus in this program is going to be on the small end of the scale, the organisms we don't see and often forget about, the microbiology of the soil. I think this is also interesting questions. "How many of these organisms might we find in soil?" Just how abundant are they? The numbers are truly staggering. It's also remarkable that as the organisms get smaller, both their numbers and their weight (biomass) tend to increase. With these kinds of numbers, it is not surprising that soil organism can have significant effects on the functions of agricultural soils.

We cannot consider the fungal numbers easily. 15,000 lbs is approximately the weight of 15 cows. Think of how 15 cows impact an acre of pasture. Now imagine those 15 cows on that same acre year round. We now have an imagination of the diversity and abundance of soil organisms. How do all those organisms interact with each other in the soil ecosystem? While a more diverse soil ecosystem will not always mean a more healthy and productive soil, in general this will be the case. Two reasons for this relate to stability and resilience.

Stability of a system refers to its ability to keep on functioning if one aspect of that system breaks down. A diverse soil ecosystem has multiple ways of performing the same function. Like the space shuttle, if one system breaks down, there is a backup system already in place to take over.

Resilience of the system refers to its ability to bounce back or resume functioning following a severe disturbance. One example is the ability of a soil to return to normal functions following a severe drought.

In addition to adding organic matter to soil, plant roots also have a great influence on the soil biology in the volume of soil immediately adjacent to them. This volume of soil is known as the rhizosphere and usually extends about 2 mm (1/10 in) out from the surface of living roots. Plant roots exude organic materials into this zone as well as dead cells sloughed from the growing roots. These sources of organic carbon greatly increase soil microbial life in the rhizosphere compared to the bulk soil. The

net effect is beneficial for plant growth since the microbial activity tends to increase nutrient and water supply to the root. Rhizosphere activity also appears to increase root soil contact and to lubricate root extension through the soil.

We will look at three examples of interactions and interdependency: Organic matter decomposition, Symbiotic nitrogen fixation, and Mycorrhizal fungi. The process of degrading fresh organic materials added to the soil is a complex process that involves intricate interplay from numerous species. If some of these organisms are absent, decomposition and related nutrient cycling will be much slower and may stop altogether.

Decomposition of complex organic material like plant litter begins with mixing and shredding. Earthworms and other soil arthropods are very adept at this. Earthworms pull litter into their burrows and mix it with soil. Insects and other macro-arthropods feed on the litter pulling it apart into small pieces. Mixing the material into the soil brings it into contact with other soil degraders and greatly increases the surface area exposed to the degraders.

When fresh organic material is mixed into the soil, bacteria respond almost immediately. They begin to feed on the simple organic compounds such as sugars, proteins, and amino acids. Bacterial numbers increase very rapidly in response to the food source. But the bacteria have a harder time with some of the more complex organic compounds in the litter, and these complex compounds sometime prevent the bacteria from getting at remaining material they could degrade. It's as if the food is locked in a cupboard.

Now we can bring on the fungi. Their populations increase more slowly than the bacteria, but they are able to degrade the complex compounds the bacteria could not get at. Things like cellulose and lignin. The degrading work of the fungi helps to open up the locked cupboard and give other microbes access to the remaining simple compounds.

The final degraders are the actinomycetes. They are the clean-up crew and come in at the final stages of decomposition. Like fungi they are able to degrade complex compounds like cellulose, lignin, and chitin.

No to be forgotten are the protists and nematodes. These are the predators, hunting around in the soil for the creatures that got fat from eating the plant litter. They feed on the bacteria and fungi and release nutrients into the soil. Related to nitrogen

availability is symbiotic nitrogen fixation, a well-known process to farmers world-wide. Many bacteria have the ability to convert nitrogen in the atmosphere into inorganic nitrogen that plants can utilize. This process, however, can be made much more efficient if the bacteria don't have to go searching for food to keep themselves functioning. Some species of bacteria, notably the rhizobia, have developed symbiotic relationships with the roots of leguminous plants. The plant roots keep the bacteria well supplied with the sugars they need to thrive. In return the bacteria busily fix nitrogen and supply it to the plants.

Another symbiotic relationship in the soil, that of the mycorrhizal fungi, may be less familiar. Although many fungi live by degrading organic material in the soil, there are also several fungal species that rely on a close association with plants for their livelihood. These are known as mycorrhizal fungi. The term mycorrhizae mean "fungus root". These are symbiotic relationships because they benefit both plant and fungus. Some of these fungi live on the external surfaces of roots, while some actually invade the root cells of the plant. Shown here is an example of a fungus that has invaded the cells of a plant root. This type of fungus is known as a "vesicular arbuscular mycorrhizal" fungus. The VAM fungus forms arbuscules inside root cells where there is an exchange of nutrients provided by the fungus, and sugars provided by the plant. The vesicles are storage organs formed by the fungus. These types of fungal - root associations are formed with almost all important agronomic crops.

The fungi benefit from the association with plant roots because they can feed on sugars produced by the plant. Because of this the fungus does not have to compete with other soil organisms for its food. The plants benefit because in return they receive nutrients and water from the fungi. The fungal hyphae are able to reach a much greater volume of soil than the plant roots can. In many cases they extend 5-10 cm beyond the reach of the roots. The hyphae also can squeeze onto soil pores spaces that are too small for root hairs to penetrate. In many cases the fungi are better at extracting nutrients from soils than are plant roots. This is especially true of phosphorus, and especially true in low fertility soils. The fungi also bring water to the plant roots. Shown here is an example of the beneficial effects of mycorrhizal fungi on the growth of Douglas fir seedlings.

Conclusion of Chapter 2

Healthy soil is healthy food, so soil feeds the

plants, plants feed the animals, animal feed the soil, so Earth lives. In chapter 2, I tried to find a co-relationship among these three fields with soil science: biodynamic, permaculture, and organics. I understood the relationship of the three of them from different perspectives.

I've always known that there was more than meets the eye in all that dirt, and now I know what it is. It's life. Between the tiny pieces of rock (minerals) and the decaying plant matter, right next to the roots of plants and the above the clay level lives billions of organisms. Each one, be it bacteria, fungi, nematodes, protozoa, worms, grubs or rodents, has a function in the soil. It shouldn't be forgotten that all living things including humans obtain minerals from weathered rocks and organisms from dead animals and plants. Ecology of soils, continuous cycling of minerals and organisms, influences environmental contamination, nutrition, health, and the greenhouse effect as well as diversity of life.

Therefore, understanding soil ecology is the key to approach earth ecology. I would like to learn more about the relation between living things and soil, how to make the soil rich, the positions, roles, and contributions of microorganisms, animals in the ecological system from biological and chemical approaches.

Chapter 3 Eco Park

We share our Jeju story with the King cherry blossoms, century old volcanic stones and further away, with Halla Mountain and stars. Although many Jeju people died like microbes (de-amorization), others survived on the love of family. As the Jeju people survived on the love of family and togetherness, the same idea relates to the natural elements for surviving in the universe as microbes.

The thin layer of soil that forms a patchy covering over the continents controls our own existence and that of every other animal on land. Like invisible bacteria exist in the dark realms of the soil (Carson, 1962, 53-54). This is a very fundamental question: what is all this for? The answer is for our life. It is as full of mystery, wonder and awe as the world beyond. So we have to save and keep our soil. All life depends on 6 inches of soil. How important and amazing bacteria are in our home and story. If I wish ardently with all my heart, the entire Universe works for me.

Seoungsan parish Eco Park for living soil in Jeju volcanic Island

If the soil pollution happens, all creatures living on the ground suffer from that. Furthermore, it is hard to make it original. Polluted soil also kills microbes so that they cannot dissolve organics.

We have seen many kinds of environmental pollution. Regardless to say, we must keep the environment clean. To prevent soil pollution, farmers need to adopt environmental friendly farming. We should do the recycling to prevent the soil pollution. If the technological and industrial society polluted the human society, what effect did it have on the microbes? It is necessary to change our consciousness here, and the first step is to look at the microbes.

I worked in the organic product movement for the last seven years with the goal of promoting a soil food web. During that time, I taught many farmers and learned from experts about organic farming. At the same time I inspected farms that wanted to cultivate organic products. I am convinced that there is a specific direction for this in the future, but agricultural policies have long failed. Many farmers have fallen into debt and most older farmers are still attached to customary agricultural methods. There are certainly difficulties to be endured to create organic farms. During the heat of summer, farmers must eradicate weeds by themselves in lieu of using pesticides and chemicals. And I had promoted non use of pesticides and organic farming of mandarin oranges, etc. After the harvesting of these produces, I even had driven a 25ton size truck full of produce to sell directly to the consumers across South Korea. Above all, I began to feel that my role was not necessarily within the church, but rather outside church, with the church leading the movement.

At last, I decided to create an Eco Park at the church, which I did for my last 2 year. When I was in a parish ministry, this happened at my third parish on Jeju Island. I and an associate pulled the ocean water from the marsh into the church ground, so that the ecosystem could breathe and survive.

35 years ago, the Jeju government had devised a plan that would cut our church in half. The city's plan would require the cutting of many trees and the destruction of the rich soil. In order to preserve our church, the parishioners and I created an environment protection group. During this time, I, along with the entire parish, prayed for two years that the city would decide to keep the church in its natural state. In addition to that, we prayed the

novena everyday at 5:30 A.M. for 54 days for 2 years without rest.

I and parish associate also planted various flowers for purifying the surrounding and for beautification. Significant signs of nature's revival began to appear, such as snails, sea squirts and the like.

According to the seasons, we planted fruit trees so that kindergarten children could experience the living system of nature. We remove weeds to strengthen the lawn soil and scattered sand instead of agricultural chemicals.

We also built greenhouses and bought equipment for garden maintenance to reduce future costs. Moreover, we began to make E.M. soap in order to educate associates and unexpectedly, profits were good. Many people recommended the soap once they realized its efficacy.

We also began to raise pigs for the purpose of food recycling, feeding them food scraps from around the village. We often controlled lichen work in the lake, occasionally tasting the water for salt content. Generally it consisted of the fresh water that arose from underneath the lake. Even such soil near the ocean had waited for the human touch. The microbes in both the soil and lake began to revive, and the grass grew vigorously under human concern rather than agricultural chemicals. At result many people visit the eco-park at the church, over 200 persons a week. (Below, Eco-Park in Jeju)



Conclusion of Chapter 3

I believe the church's responsibility is not strictly the practice of liturgy or doctrine, but rather living in symbiosis with all of nature. I will continue in the organic movement with confidence. Even though my home town of Jeju Island has a painful past and its people have been living difficult lives based on poverty, we have to remember that we have only one earth. This is the Great Work Eco theologian Father that Thomas Berry (1914 – 2009) calls us to accomplish in our time, and assistance for this important quest can only come from a cultural awakening that is respectful to every bioregion.

(Berry, 1988, 96) So we can leave clean an environment to the future generation. To save the earth, we need allied effort of all of us. Father Emile Taquet made me engage with deep ecology and inspired me to act to save the Jeju Island.

Conclusion

Jeju early Catholic believers and plants followed Father Emile Taquet as if he were their father, who listens, sympathizes, and talks to them with sincerity. By building such a strong relationship, he dedicated himself to a bigger plan of God rather than his own goal.

While performing the project, I have researched Father Emile Taquet by listening to the significant plan of God. Finally, I could meet him and started imagining he also had a faith in God that it made him a better leader even than before.

According to Gospel Luke, lines from 18 to 19 in chapter 13 (Luke, 13, 18–19), Jesus described the world of God as a mustard seed. If we plant the invisibly small mustard seed in the ground, it would become a sprout, then branches, then tree with fruits, and eventually birds would come and stay there.

If we live in the faithful loving relationship with God, we live as fully confident leaders of this society, and eventually the vulnerable including Nature with low self-esteem will come to us. The reason why Jesus came on Earth and died on the cross is also to restore the relationship between us and God. Father Emile Taquet would be the person who shows the love of God, amorization. Thus, rather than to boast of his support for the 13 years in Hongro, I would like to mention that he felt very happy to share all the problems with Jeju people and Nature, to rejoice with them, and to make relationships with them to relieve their sorrow. I found the most important elements of Father Emile Taquet, that are profound loving relationship between him and God, between him and nature, meeting of eyes to eyes, understanding, communication, consideration, trust, conversation, sympathy, confidence, prayer, and patient attitude.

Voice of amortization:

I remember the Brian Swimme's saying in his office in the school last year, we also must sacrifice ourselves to initiate the restoration of Earth, but we are not doing so due to our selfishness, fear, and refusal to accept our role and lose whatever power, connections and advantages we currently have. To

take the first step in the direction of restoration, we must first feel the pain. Once we have felt it, it means the process of change in our consciousness has begun. To sustain our role in this project, we must listen to the voice of LOVE.

Today, however, people in Jeju are following the modern wave of capitalism and consumerism. The frugality, the love of nature, and the love of life are disappearing. Especially the Jeju Government's plan would require the cutting of many trees and the destruction of the rich soil in 500meters of Bijarim Road, this cutting of trees injures the same nature that we had grown so fond of, the same nature that I had learned to call my family as the mountains were my uncle and the seas, my aunt, and the same nature that our children would miss out on. Recently, many social activists and peace makers have embraced the cut trees at the road, thus approaching this problem through subtle activism.

Jeju people have lived in poor circumstances, but they have maintained good relationships with their fellow islanders. Their vitality has come from their relationships with others. From the fear of natural forces, our Jeju Island ancestors had worshiped many gods to protect themselves and shamanism had been prevalent in the land of Jeju. Yet Jeju is going on a tremendous Journey that is both dynamic and dangerous. All humans and nature are an ocean of energy like Great Mother Halla Mountain.

Today we are invited to create Jeju as an on-going story that very much involves us and evolves all around us... In every direction in which life evolves, the propagation is in a straight line (Bergson, 1998, 103-104). Jeju story is not a product of an inert historical event. It means that we have to carry the memories of our family and also of other human beings. I am sure we would be more excited when we realize how God made us with such an immense love, amorizaion. The answer to this role lies on our hidden potentials including all Jeju living beings.

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The limitation of this paper:

I experienced many conflicts between my research and my own work, so I should have a plan next time with rich soil for King Cherry Blossom.

Another limitation for me was the research about the childhood memory of Father Emile Taquet even though I asked this data from the Paris Foreign Missions Society in France.

Third limitation was the plants themselves that Father Emile Taquet collected. I think it will take at least several months of gathering the data about that.

References

- Bergson, Henry. 1998. *Creative Evolution*, trans. Arthur Mitchell, New York: Dover Publications, Inc, 103-104
- Berry, Thomas. 1988. *The Dream of the Earth*, San Francisco: Sierra Club Books, 96
- . 1999. *The Great Work: Our Way into the Future*, New York: Bell Tower.
- . 2009. *The Sacred Universe: Earth, Spirituality, and Religion in the Twenty-First Century*, New York: Columbia University Press.
- Boff, Leonardo. 1997. *Cry of the Earth, Cry of the poor*, NY: Orbis Books.
- Carson, Rachel. 1962. *The Silent Spring*, Boston: Houghton Mifflin, 53-54
- Conlon, James. 200. *Beauty, Wonder and Belonging*, Ohio: Wyndham Hall Press.
- Darwin, Charles. 2006. *On the Origin of Species*
- De Chardin, Pierre Teilhard. *Hymn of the Universe*, 1965: Eng. tr. by S. Bartholomew, *Hymn of the Universe*, New York: Harper & Row, 19-37
- . 1999. *The human phenomenon*, Ed. And trans. Sarah Appleton Weber, Brighton, UK: Sussex Academy Press, 262-265
- . 1978. *Activation of Energy*. Trans. Rene Hauge, NY: Hacourt,
- . 2012. *Heart of the Matter*, NC: New Growth Press.
- Hawken, Paul. 2010. *The Ecology of Commerce*, NY: Harper Business
- Rogers, Kath, and David, W. Kaimipono, 2017. *Environmental Justice Reparations for Jeju Island*, Jeju: World Environment and Island Studies, Vol.7, N.2, 95-104

- Kuhn, Thomas. 2012. *The Structure of Scientific Revolutions*. Chicago: The University of Chicago Press.
- Lawenfels, Jeff & Lewis, Wayne. 2010. *Teaming with Microbes*. Portland: Timber Press.
- Macy, Joanna. 2003. *World as Lover, World as Self*. Berkeley: Parallax Press.
- Nardi, James B. 2007. *Life in the Soil*. IL: University of Chicago Press.
- Pope Francis. 2014. *The Joy of the Gospel*. Rome: Vatican Press. 174–175
- Swimme, Brian. 1984. *The universe is a green dragon: A cosmic creation story*. Santa Fe, NM: Bear. 25
- Swimme, Brian, and Tucker, Mary Evelyn. 2011. *Journey of the Universe*. New Heaven and London: Yale University Press.
- Swimme, Brian, and Thomas Berry. 1994. *The Universe Story. From the primordial flaring forth to the Ecozoic era—A celebration of the unfolding of the cosmos*. San Francisco: Harper Collins.
- Tarnas, Richard. 1993. *The passion of the Western mind*. New York: Ballantine.
- , 2006. *Cosmos and psyche: Intimations of a new world view*. New York: Viking/Penguin.
- Taylor, Charles. 1989. *Sources of the Self*. Cambridge: Cambridge University Press, 1989
- Taylor, Sandra Anne, 2015. *The Akashic Records: Access the Greatest Source of Information to Empower Your Life*. India: Hay House Publishers India.
- Thoreau, Henry David. 2009. *The Journal: 1837–1861*. Ed. Daimon Searls. New York: New York Review Books. 26

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