

**Free Money and Other Complementary Currencies
as the Ideal Unit of Autonomy**

Hironori Nagamatsu

15th Sep 2011

**This thesis is the revised version of MA dissertation that was submitted
to Peace Studies Department, University of Bradford, UK
at 1st Sep 2011.**

Abstract

The aim of this study is to explore the mechanism of Free Money¹ from the perspective of its universal validity, and the reality of the relationship between the Complementary Currencies and autonomy. Its concept was born in Europe in the first 20th century. Until now, only a small number of people have known the importance of its idea. Most of the Complementary Currencies in the world have defects in their systems because of not having the function of Free Money. Its function satisfies the law of entropy that economics ignores and can operate permanently in society. Unless its function is adopted, the problems inherent in the today's economic system will not be solved and sustainability will not be realized. Furthermore, this concept has the potential to support other projects such as the Transition Town project and permaculture to achieve the realization of the ideal lifestyle and local community and the Solidarity Economy in order to protect indigenous and poor people from neoliberalism. As the ideal unit of autonomy, through Free Money a more stable community can be realized.

¹ Free Money is the concept that the face value of the currency gradually decreases suggested by Silvio Gesell (1862-1930).

Keywords

autonomy, Complementary Currency, entropy, Free Money, permaculture, Solidarity Economy, sustainability, Transition Town.

Acronyms and Abbreviations

CC/CCs Complementary Currency/Complementary Currencies

SE Solidarity Economy

TT Transition Town

Acknowledgement

My dissertation is the result not just of my own efforts but also of encouragement and support of invaluable people around me. First, I would like to express an appreciative gratitude to Dr. Graeme Chesters, my supervisor, who guided me academically, providing insightful advice and responding quickly to my inquiries regardless of any time limits. His supervision made me realize the virtue of engaging in intellectual endeavour connecting with social movements. Second, I would like to extend sincere gratefulness to Miguel Yasuyuki Hirota, a social activist of the Complementary Currencies and Solidarity Economy, and Christian Gelleri, director of Chiemgauer. These two pioneers helped me to obtain specific knowledge about the Complementary Currencies. Without their existence, I could not have been motivated to write this dissertation. Third, I must express my appreciation to Mike Tyldesley, manager of the Mitrinović Foundation (the former New Atlantis Foundation). I succeeded in reconsidering the historic line of connecting the social movement of Free Money with a New Age movement. If the foundation does not exist, this dissertation would be a mediocre one. Additionally, I would like to express a sincere gratitude to Prof. Donna Pankhurst, my personal tutor. She supported me when I was depressed about the situation of the earthquake and the subsequent Fukushima nuclear plant disaster in Japan. Moreover, I would like to express a special thank you to SarahJoy Leitch who revised my insufficient English writing with endurance. Finally, I would like to express my appreciation to my classmates and friends who often make me fun, and my parents, elder sister and brother, their kids, and other relatives who love me unconditionally. I hope that this dissertation will be dedicated to people who are committed to social revolution toward realization of peace all over the world.

Table of Contents

| | |
|--|----|
| Introduction | 1 |
| Chapter 1. A brief history of Free Money and the CCs | |
| 1-1. Silvio Gesell | 9 |
| 1-2. Rudolf Steiner | 20 |
| 1-3. Recent CCs in the World | 24 |
| Chapter 2. The Understanding of Free Money | |
| 2-1. Entropy Law and Sustainability | 33 |
| 2-2. Limit of Technology | 37 |
| 2-3. Economics and Entropy Law | 40 |
| Chapter 3. The Relationship between the CCs and Autonomy through Recent Social Movements | |
| 3-1. CCs as the Unit of Local Autonomy | 49 |
| 3-2. Transition Town, Permaculture, and Solidarity Economy | 52 |
| Conclusion | 56 |
| Figures | |
| 1. Three Types of Money in Circulation | 22 |
| 2. WIR System | 25 |
| 3. The Chiemgauer Currency Cycle | 30 |
| 4. The Law of Entropy I | 33 |
| 5. The Law of Entropy II | 34 |
| 6. The Law of Entropy III | 34 |
| 7. Spread of Petroleum | 35 |
| 8. Hierarchy of Physical and Economic System | 36 |
| 9. Money in Circulation | 47 |
| Postscript | 59 |
| Bibliography | 61 |
| Appendix | 69 |

Introduction

Background

It has been a while since a famous book “Limits to Growth (Meadows et al, 2004)” was published. In this book, the authors alert the reader to the limitation of the recent economic development. In addition to this, when Malthus’s (1766-1834) theory of “An Essay on the Principle of Population (1798)” is adapted to current global situation, exponential growth of populations overwhelmed the arithmetical growth of food supply; they demonstrated that humans need 1.2 times as much as the earth can produce in order to satisfy human demand (Meadows et al, 2004: 5). In fact, there have already been undesirable signs in the world that relate to the limits to growth. For instance, the sea level has risen 10-20 cm since 1900; the FAO has stated that 75 percent of the fisheries of the world’s ocean were beyond the capacity in 2002; and 45 states experienced declines in per capita GDP for a decade during 1990-2001 (Ibid: 3).

How have these things occurred? The authors appear to have thought, perhaps radically so, that ‘society develops technologies and markets that hasten a collapse instead of preventing it.’ (Meadows et al, 2004: 8-9). To some extent, this may be perceived as correct, and some people would agree with them and then try to achieve a different society, while some deny it and continue with contemporary lifestyles or to develop technologies in the same way. They think that continuous innovation can overcome difficulties of today’s society. It is natural they think so because transnational organizations basically offer the successful strategies to them. For instance, the World Bank supports an innovation regime of a country in order to increase the quality and

sustainability of economic development (Fan, et al, 2009: x). There is the basis for arguments on both sides. However, it might be posited that the number of people who would like to change society is seemingly increasing. For instance, In the World Social Forum, which is a counter forum against the World Economic Forum that is handled by political and economic elites, the number of the participants gradually increased. In 2005, there were around 155,000 participants while only around 20,000 in 2001 when the forum began (Dantas, 2005: 9). It is probable that each person has an individual reason for doing so. Perhaps, people have experienced events that have left a lasting impression and gradually acted to change people's minds. For example, in 2008, one of the biggest economic disasters, the Lehman Shock, caused some people to react, which caused complicated and high-developed financial commodities in the virtual market to throw the real world into chaos, and people began to quit participating in money games such as online trading at home. Some may have worked out what led to the Lehman Shock. According to Hwa, et al, 'In the past (until the cold war), rocket scientists — people with advanced degrees in the sciences — have been employed in Wall Street to develop new financial products by using financial engineering models. Today, these people are called financial engineers.' (2010: 25). Their calculation ability contributed to this economic disaster for the extreme risk dispersion of financial commodities such as Credit Default Swap (CDS).² It can be said that when these kinds of events, which might include the recent Fukushima nuclear plants explosions, happen, ordinary people often shift their mindset from the old one to a new or alternative one.

² This information was broadcasted by NHK (Japanese Broadcasting Corporation) in 2009: the special TV program 'Money Capitalism.' The relationship between economy and war cannot be ignored when an alternative world is concerned.

In these circumstances, meanwhile, academia always tends to be late in shifting values compared with those out of university circles. Grassroots movements are always ahead. Therefore, when new or alternative ideas for society are considered, new values must be known.

Rationale

Nowadays, in many places in the world, the use of Complementary Currencies (CCs)³ can be seen as a form of protection for small communities protection or their economic independence from the world economy. In the UK, the Transition Town project attempts to put the CCs into their own small villages such as the Totnes Pound as one of the projects (Hopkins, 2008: 197-200). In Virginia, the council suggested establishing a subcommittee to discuss whether the Commonwealth should adopt the CC to serve as an alternative to the official currency distributed by the Federal Reserve Bank in the case of a major breakdown of its system (Virginia Government, 2011). From the viewpoint of local economics, the CCs can potentially protect local communities against the economic destruction of a neoliberal economy when it is handled properly, because the introduction of the CCs may serve as a signal of demand for local goods against import goods (Jayaraman and Oak, 2001).

However, in this dissertation, I would like to examine this phenomenon from more

³ There is a similar term ‘local currency,’ which is familiar in UK. Because to focus on the different function with usual currencies and these currencies are not always used by local governments, the term ‘complement’ deserves to be used.

fundamental perspectives, not economics: i.e. in perspective of the research about whether the CCs adapt to natural, physical, and even universal laws or not. Because, some social activists and supporters of the CCs are those who would like to live together with nature by way of, for instance, permaculture to shake off a materialistic society in which the goal of life is to merely consume in ever larger amounts. Their motivation does not come from knowledge of economics but the understanding of natural laws. This also means that their conduct is based on a human moral sense. In fact, over history, men who are not economists but certain philosophical or religious thinkers and leaders have denied making money for profit or the advantage of the monetary system itself. For instance, Kant (1724-1804) remarked in his *Perpetual Peace* (1784), 'No national debt shall be contracted in connection with the foreign affairs of the nation.' (:109) Moreover, '[...] as an instrument in the struggle among powers, the credit system [...] of endlessly growing debts [...] is a dangerous financial power.'(Ibid). In the first place, Jesus says, '[...] it is easier for a camel to go through the eye of a needle than for someone who is rich to enter the kingdom of God.' (Matthew, 16:24). In the case of Islam, there is 'Riba' that prohibits interest; 'Allah has permitted trade and has forbidden interest.' (The Qur'an, 2:275). And, the idea of Free Money does satisfy the demands of them and all other people who would like to follow those principles.

I am not of the opinion that the necessity to have an understanding of economics should be underestimated, nonetheless, for instance, it is famous that Keynesians are often trapped in a dogmatic idea that simply makes the world more complicated. I am of the

opinion that a one-dimensional perspective does not produce proper results because it probably lacks consideration of some important dimensions of society, while if people like a radical and simple idea or slogan then it spreads.

The Aim of This Dissertation

Hence, this study will explore the mechanism of Free Money from the perspective of its universal validity, and the reality of the relationship between the CCs and autonomy will be discussed to consider the CCs as the ideal unit of autonomy, through recent social movements in which the CCs are practiced. I hope that the understanding of Free Money will lend support to many grassroots movements for the social change.

Key Research Question

Sadly but not surprisingly, it is not always the case that grassroots activists understand natural laws. Also, they are prone to forget or ignore them even when they do understand. Free Money — money that diminishes its face value gradually because of the demurrage effect; in other words, money that has a life expectancy — conforms to natural law but the concept that there are two currencies (the CC and the currency of the country) is too complicated to understand. It is difficult to know why another currency is required. Therefore, in this study, an understanding of Free Money is indispensable to consider the realization of autonomy. Recent social movements such as the Transition Town and Solidarity Economy are now the first step to achieve such purposes. It is hard to say where alternative currencies are being spread that have the same function as the ordinal currency that they will necessarily be successful. Understanding that the

function — money that never dies — does not work in the long run is necessary. Because the existence of contemporary currencies is very common in daily lives, it is difficult for people to imagine the existence of a different currency. Only after the concept of Free Money is understood, will these social movements achieve their ultimate purposes because understanding of Free Money, which adapts to universal law, means that people face truly their reality. Rudolf Steiner (1861-1925), one of the men who suggested the same concept of Free Money, said, ‘There is much talk of what should be done, but there is little will, alas, to dive down into realities and to draw forth from there the word which tells what should be done.’ (1922). Deep understanding of the universal law brings people’s awareness about reality.

Therefore, the question will be explored from the perspective of universal law. In short, the function of Free Money is to make a social economy obey the law of entropy. Free Money realizes sustainability in the field of economics. Nowadays, thermo-economics uses the concept of entropy as biophysical economics (Baumgärtner, 2004: 103). So, it can be said that the purpose of this study is to adapt the concept of entropy to the whole field of economics.

If people fully understand the concept of entropy, they can refuse the operations of nuclear power plants, not because radioactive substances are extremely dangerous to humankind but because they are logically wrong. Also, people can refuse to participate in an oil-based economy not because peak oil has arrived but because the economy is systemically wrong. In turn, people can even resist the monetary system because

currencies that accumulate permanently in the system are acting against the law of entropy and they support the today's dominant social structure in which entropy increases. The earth of course cannot expand so this social system will collapse.

Structure of this dissertation

This dissertation consists of three chapters. The first chapter will introduce a brief history of Free Money to reconsider how activists have struggled to apply it, and successful examples of the recent CCs to show these varieties of application. The second will be an explanation of the entropy law and its adaptation to economics and money itself with other laws such as the limits of technology and natural circulation. In the third chapter, the relationship between the CCs and autonomy will be analysed with consideration of the CCs as the unit of local autonomy and recent social and grassroots movements such as the Transition Town and the Solidarity Economy.

Methodology

This research is a library-based study. I use both general books and the Mitrović collection, which includes major literatures for chapter 1. The Mitrović collection is the special collection that tells the activities of Dimitrije Mitrović (1887-1953) who is a Serbian philosopher. Other sources will be from online journals and homepages. To keep up-to-date with today's social movements, many news articles will be used, mainly from The Complementary Currency Resource Center that produces specific information relevant to this dissertation. Also, the metaphysical perspective will be introduced in order to explain entropy law. I believe that this perspective is useful to

understand things deeply although there is a criticism that this does not stand up but is merely a hypothesis. It is impossible to prove that the metaphysical theory is right in this short paper. I hope that this perspective will be accepted as one of many possible perspectives.

1. A brief history of Free Money and the CCs

1-1. Natural Economic Order

Silvio Gesell

The man who proposed the concept of ‘depreciating money’ is a German merchant and economist Silvio Gesell (1862-1930). In his book “Natural Economic Order (1911)”, the idea of depreciating money was introduced, which he called ‘Free Money (Freigeld),’ Gesell strongly insisted that it would resolve social problems in Germany and other European countries right in the middle of major upheavals. Historically, the more you go back to the past, the less life expectancy a currency has as the substance of the exchange tool. Nowadays, currencies usually have semi permanent life expectancy. Contemporary currencies even do not need to exist as matter if they are merely recorded on an account book inside a computer. On the other hand, for instance, in the period of the ancient Rome, currencies were cast in silver which gradually oxidized and subsequently decreased in value. For this reason, no one would have conceived of the idea of depreciating money in the past. In later times, in the late 19th century the gold standard was established and currencies did not age. Moreover, in Europe at that time, the economy was no longer the problem of the one state but of all. An alternative concept about economic issues perhaps had been necessary because capitalism, which has defects per se, emerged at that time. Rather, after the Industrial Revolution, which produced a situation where the division of labour developed and proletarians came into existence, the fact that social movements acted for the protection of proletarians increased in many areas of Europe and this probably means that the economy begun to be considered at the citizen level, not only of the bourgeoisie but also of the proletarians.

Gesell was definitely one of the people who participated in the social movements of the time. It might well have been inevitable that the concept of depreciating money was born in this period.

Silvio Gesell, the son of a Wallon Catholic mother and a German Protestant father, was born on March 17th 1862 at St. Vith, the then German territory, today's Belgian territory near the German Luxemburgian border. After spending a short time in the civil service, he went into business in 1882, first in Germany and later in Spain. In 1886, he emigrated to Argentina and founded a business as an importer of surgical articles. In those days, Argentina was in a situation of economic anarchy. Her general price level and foreign exchange rates fluctuated widely. Due to the experience of this situation, Gesell became interested in the monetary system. In 1891, he published "The Reformation of Currency as the Bridge to the Social State," and a year later his "Nationalisation of Money" was released. In 1898, Gesell warned of the problem of the Argentinian government's deflationary policy in his "La Cuestión Monetaria Argentina." He sold his business before the economic crisis, and then he retired and moved to Switzerland, where he deliberated on economic problems whilst working as a farmer.

In 1911, "The Natural Economic Order," in which he analysed the fundamental factors of land and money by offering 'a most damaging criticism of traditional economic theory,' was published (Butchart, 1936: 14). After this, his struggles as a social activist began. In the disorder in the World War, this book spread over Europe and Gesell felt the possibility of a revolution was in the air. At the time of the advent of the Hoffman

Government in Bavaria, the government offered him a post on the State Socialisation Committee. While he was waiting to take up his duties, the government was overthrown and Gustave Landauer (1870-1919), a leading German theorist on anarchism, set up a new government. Gesell was soon offered the post of Minister of Finance. A week after he took office, however, the Landauer regime was overthrown by the Communists. Furthermore, the Communist Government was overthrown three weeks later. Gesell was arrested in the confusion and accused of high treason, but acquitted. He died at Eden-Oranienburg, near Berlin on 11th March 1930.

Free Money

The Natural Economic Order begins with a comparison between Proudhon⁴ (1809-1865) and Marx (1818-1883). Gesell says that ‘Proudhon was the only socialist who advocated the abolition of unearned income by means other than socialization.’ (Gesell, 1911: 10). Gesell thinks that Proudhon’s analysis of capital was correct. On the other hand, Marx ‘succumbs to a popular fallacy and conceives capital as real wealth.’ (Wise, 1940: 4). According to Marx, ‘surplus-value’ must invariably be positive.’ (Ibid.: 5). Proudhon suggests that ‘the possibility of negative surplus-value must be taken in to consideration.’ (Ibid). The word ‘negative’ is key in order to understand Gesell’s Free Money. Gesell says ‘Money, you imagine, is the key that opens the gates of the market (exchange of products): that is not true — money is the bolt that bars them.’ (Ibid). This remark relates to one of the functions of money ‘saving.’ Gesell tried

⁴ Pierre Joseph Proudhon (1809 –1865) is a French politician, and socialist. He was the first person to call himself an anarchist. He was a socialist but he was against state ownership of capital goods because he thought workers themselves should have it.

to abolish this function from money. (A full account of this remark will be explained in Chapter 2).

The major principles of Free Money are the following.

1) 'Free Money is a stabilised paper-money currency, the currency notes being issued or withdrawn in accordance with index numbers of prices, with the aim of stabilising the general level of prices. Free-Money, decimal currency is issued in 1 - 5 - 10 - 20 - 50 - and 100 dollar (franc, mark) notes (bills). The monetary authority also sells, through the post- office, currency stamps value 1 - 2 - 5 - 10 - 20 and 50 cents.' (Gesell, 1911: 123).

2) 'Free Money loses one-thousandth of its face value weekly, or about 5 percent annually, at the expense of the holder. The holder must keep the notes at their face value by attaching to them the currency stamps mentioned above. A ten-cent stamp, for example, must be attached every Wednesday to the \$100 note, which is shown as it will appear during the week August 4th - 11th, 31 ten-cent stamps (\$3.10) having been attached to it, on the dated spaces provided for the purpose, by its various holders, one stamp for each week since the beginning of the year. In the course of the year 52 ten-cent stamps must be attached to the \$100 note, or, in other words, it depreciates 5.2 percent annually at the expense of its holders. For small change up to one dollar (1 - 2 - 5 - 10 - 20 - 50 cents) the currency stamps themselves could be used, in which case they would not be reissued when paid in at public offices, but

replaced by fresh stamps. The currency stamps would be sold in small perforated sheets resembling a page from a postage-stamp booklet, the total value of each sheet being one dollar.’ (Gesell, 1911: 123). This mechanism is called ‘demurrage.’

- 3) ‘At the end of the year the fully-stamped currency notes are exchanged for fresh notes, for circulation during the following year.’ (Gesell, 1911: 123).

Many people will think that this system is complicated, and it will be hard to use Free Money practically. However, capital and interest are considered, people will realize that this system is useful. There are three types of capital in economics: money-capital, real-capital, and human-capital (labour power). In the today’s capitalistic system, interest is basically plus. Except money-capital, capitals are toward minus and became zero if these are left. Real-capital (nature) decays gradually. And, human-capital (labour power) will decrease, unless the new generation should be educated in order to replace the old one. So, it can be said that education is an investment. These characteristics bring contradiction. Only does money-capital continue to increase and is fundamentally different from the other two capitals. Definitely, Gesell tried to resolve this contradiction by abolishing unearned income based on money. In his prediction, if Free Money is put into circulation, a clear distinction between a means of exchange and of saving will be established and then holders of money must put money into circulation without any conditions for profit.

In Addition, Gesell suggests the concept 'Free Land' in the Natural Economic Order. As well as the concept of Free Money, he tried to abolish a profit without work, the right of rent on land. In his theory, land generally belongs to nature. So states conduct a public tender of the right of use of land under state control and just manage it. Private land cannot exist. This concept, however, has not been recognized well so far. Because Free Land is merely a concept about the system of the control not about practical tools like Free Money. Currencies are the concrete substances and Free Money has the clearly different function from major official currencies. It is recognized in respect of the function of the existence of Free Money itself, not the system of control. Gesell advocated Free Money as the existence that is run within the system per se. The concept of Free Land is probably regarded centralization by the state in the long run and corruption cannot be stopped.

Free Money Experiments

In the early 20th century, there are some examples of Free Money being practiced by those who were inspired by Gesell's theory.⁵ The first instance of practical success of the Gesellian principle can be seen in the mining town of Schwanenkirchen in Bavaria in 1930. In this year, there were seven million unemployed in Germany. The owner of the local mine, which had been closed for several years, tried to obtain a loan from a bank in order to open up again. After his effort became vain, he contracted with the Wära Exchange Association (WEA), which tried to practice Gesell's theories on a

⁵ According to Wise, in the gothic period (1150 – 1450), there were coins that use the same system of Free Money although they did not call it Free Money (1936: 9-11). However, the system soon failed because people were not explained well about its concept and importance (Ibid).

minor scale. He obtained a depreciating script Wära issued by the WEA as a loan in exchange for ordinary money. Next, he called all the unemployed miners and persuaded them to accept that the Wära was paid for salary. They agreed to reopen the mine. Then the owner approached the local tradesmen Herbecker, which had a number of warehouses, a canteen and consumable goods. Miners could use the Wära in the canteen and exchange it for food, clothing and household goods. After a few weeks, other trades people accepted the Wära and the economic boom gradually expanded in Schwanenkichen. Everyone bought the stamps to put on the Wära to escape the demurrage of one percent per month. As a result, the Wära circulation happened rapidly. However, the Chancellor ordered to issue an edict banning the circulation of the Wära and the success of Wära was subsequently forgotten.

Another incidence of alternative currency took place in the town of Wörgl in the Austrian Tyrol in 1932. Conditions in the town at the time were deplorable. Over one thousand industrial workers were unemployed. Tax arrears were 120,000 schillings while revenue in six months was just 3,000 schillings. The Mayor of Wörgl, who was a supporter of Gesellian economics, submitted an Emergency Recovery Plan to the Relief Committee in order to substitute national currency within the community. The Committee accepted the plan and issued work certificates. People who lived in the town bought these certificates and could make all payments within the community except for the post office and railways. A tax of one percent per month was required to discourage needless conversion into legal tender and used to provide relief for the aged and disabled. The Council made the first wage payment in work certificates, which was

back in the Town Treasury within a week. With this money, the Council could pay its own local debts. The certificates were back again soon. These circulated from the Treasury to the workers, from the workers to the merchants, from tenants to landlords, from servers to the savings bank, and back into circulation again. The certificates were also used for public works. The main streets were expanded, a concrete bridge was built, and streetlights were installed. As a result, unemployment was abolished. Other towns also began to issue work certificates. Around two hundred Austrian Mayors decided to follow the Wörgl experiment. However, the success of the Wörgl was beginning to alarm for the financial authorities. The country government presented objections that the work certificates were violating the privilege of the privately controlled Austrian National Bank and threatening the private monopoly of the right of issue. The Austrian Supreme Court ruled that circulation of the certificates must cease.

The third example of the success of local depreciating currencies is the Velocity dollar in Alberta, Ottawa in 1936. The Social Credit Government of Alberta introduced the Velocity dollar and required a one cent stamp each week to use it as well as the other examples. However, as usual, the Federal Government at Ottawa vetoed its use in 1937.

In all the above examples, the use of Free Money worked well until authorities prohibited them, not because of the defect of its mechanism in terms of successful economics, but because they regarded Free Money, which has a distinguished velocity of money in circulation, would make the existing social system and interest unstable. However, the 'velocity of money' is essential (it will be explained in chapter 1-2) and

its compulsory circulation is acceptable to a law of nature (it will be explained in chapter 2).

Keynes' Appreciation

The Natural Economic Order is not written in academic style. Gesell wrote it in order to reply to the interest, passion and impulse of proletarians who urgently wanted to improve their situation and intellectuals who stood by them. He often used stimulus expression in the book: for instance, '[...] even today we are as far from understanding the recognised evils of money as was Lycurgus. We can applaud Pythagoras for saying "Honour Lycurgus who banished gold and silver, the root of all evil" or sigh with Goethe "Nach Golde drängt, am Golde hängt doch alles. Ach wir Armen!" - but we can go no further.' (Gesell, 1911: 58) and '[...] How was it possible to introduce an innovation so injurious to the State ? For I, Rockefeller, am the State, and my friend Morgan and I together are the United States. Whoever injures me, injures the State. (Ibid.: 138). For this reason, intellectual readers such as economists could not help thinking that his logic was lacking and too difficult to understand. In fact, Keynes (1883-1946) wrote about the defects of Gesell's theories in his book 'The General Theory of Employment, Interest and Money' (1936). For instance, '[...] owing to certain palpable defects in the argument. I entirely failed to discover their merit.' (Keynes, 1936: 353). And, 'The actual charge suggested by Gesell was 1 per mil. per week, equivalent to 5.2 percent per annum. This would be too high in existing conditions [...].' (Ibid: 357). For one of the greatest economists in the history, Gesell achieved only half of the necessary explanation (Ibid: 356).

Furthermore, he found the purpose of the Natural Economic Order to be ‘the establishment of an anti-Marxian socialism’ (Keynes, 1936: 355). He would be correct in this definition because it was easily predicable that the concept of Free Land in the book would have the same problem of centralization as socialism. Considering the great influence of Marxism, it would be inevitable that the Natural Economic Order as the anti-Marxian socialism had been ignored. However, Keynes appreciated the possibility of Free Money by saying ‘I believe that the future will learn more from the spirit of Gesell than from that of Marx.’ (Ibid: 355). And he clearly said, ‘[...] I agree with Gesell that the result of filling in the gaps in the classical theory is not to dispose of the “Manchester System”⁶ but to indicate the nature of the environment which the free play of economic forces requires [...].’ (Ibid: 379). He thought that Gesell’s theories were not against the other economic school but were useful if the theories were estimated precisely.

British Propagandist Büchi

In the post WWI years, the man who introduced Gesellian economics to Keynes and people in the UK was a propagandist Dr. John Henry Büchi (?-?). Keynes was forced to read the Natural Economic Order by ‘his devotees [who] bombarded me with copies of his works [...].’ (Keynes, 1936: 353). At that time in the UK, social movements for the protection of proletarians were popular as well as in the European continental states.

⁶ Manchester system is an equal term to Manchesterism, Manchester school, and Manchester capitalism for the economic and social movement in the 19th century in Manchester. They were anti-war and imperialism activists and proponents of peaceful relations between people while they were advocates of free trade.

Büchi was an activist in these movements and introduced his friend, a famous socialist, the then Labour Party leader, George Lansbury (1859-1940) to the book 'Free money: a way out of the money maze' (1933), which introduced the Natural Economic Order and he asked Lansbury to write the preface for him. However, Lansbury did not fully agree with Büchi's books (Büchi, 1933: 7). Simply, Lansbury commended this book to the serious consideration of those who at the time of crisis are seeking solutions to social problems (Ibid). Nonetheless, Lansbury contributed to the spread of Gesselian economics quite significantly because he was also a famous politician and pacifist who actively participated in the social movements for the protection of proletarians such as the Poplar Rates Rebellion.⁷ Büchi's book, however, soon became difficult to obtain and people completely forgot about Gesellian economics and Keynes' remarks because people's concern shifted to know how to struggle with the situation of the World WarII.

Gesell's Morality in Economics

Gesell's perspective about morality can be demonstrated in the following sentence. 'Free-Money applies the Christian maxim: whatsoever ye would that men should do to you, do ye even so to them. It says: If you wish to sell your produce, buy the produce your neighbour wishes to sell. If you sold for 100, buy for 100 in return. When everyone acts in this manner, everyone will be able to sell his whole produce and to save. Otherwise savers mutually deprive one another of the possibility of carrying out their purpose.' (Gesell, 1911: 140). He insists that people must not save their profit however much they would like to do so and tried to adopt the principles of fraternity to

⁷ Poplar Rates Rebellion was a tax protest that took place in Polar, London in 1921 led by Lansbury.

the field of economics. However, as Keynes said, Gesell's theory is far from perfection. Moreover, as the concept of Free Land is doubtful, the form of state-management of Free Money makes readers wonder whether the form is ethically achievable or not. This means that gigantic authorities such as states probably begin its corruption from the beginning of the authorities regardless of its economic system. This is perhaps inevitable in all situations This problem no longer belongs to economics but to politics or the whole of social science. Unless this universal problem is solved, Gesell's wish about the spread of Free Money based on his moral perspective will not be realized. In fact, all examples of Free Money were prohibited by gigantic authorities in order to protect their existing rights and interests.

1-2. Rudolf Steiner

Gift-money

11 years after Gesell published the Natural Economic Order, in the German cultural area where Gesell lived, there was a man who suggested the same concept of Free Money and solutions about the problems of political structure. His name is Rudolf Steiner (1861-1925), a philosopher who created Anthroposophy.⁸ In his lecture 'World Economy' held in Dornach, Northern Switzerland in 1922, he insisted that currency

⁸ Anthroposophy is a spiritual and social movement, which was risen in mainly German-speaking area, in order to obtain senses to perceive the spiritual world and spread his theories against materialism. Steiner thought the present era is the era of materialism and insisted that his lectures are based on 'spiritual science' as an alternative against natural science, which has dominated in society. Anthroposophy is a complete metaphysics. It is impossible to prove what Steiner said: for instance, the anti-Christ will appear in the third millennium; people in Atlantian time had infinite memories but could not think logically, etc. In this dissertation, Anthroposophic concepts, which are only logical theories, will be introduced.

which aged must be given for free (Steiner, 1922). He suggested classifying money into three types in the means of circulation (nature→labour→capital): loaned-money, purchase-money, and gift-money (Figure 1).⁹ He says, ‘[...] if we take the domain of purchase-money, the money will here represent a certain value. In the domain of “gift” on the other hand, the money has, in respect of all that obtains in the domain of purchase, a negative value. It lets the purchase-value vanish into nothing. Finally, between the two, the transition is brought about through loaned money. The loaned money itself gradually vanishes into gift-money.’ (Steiner, 1922). Steiner’s theories are probably unique, and are complicated to understand. What he tried to say is, in short, that economy will circulate normally only after the right of profit is given up in the phase of the gift. To achieve this, he insists that money should gradually disappear. Steiner also made a big effort to establish Anthroposophic school education, which has been practiced all over the world. Nowadays, there is a successful example of the depreciating money in Chiemsee, a rural German area practiced by a teacher of social studies at one of the Waldorf schools (Steiner’s schools), which is called Chiemgauer (Hirota, 2006: 1-3).

⁹ In Anthroposophy, Steiner preferred to classifying something into three elements: for instance, spirit (ghost), soul, and body as human composition, God, Angel, and human as the hierarchy of the world. This classification is called ‘trinity.’ In this case, loaned-money, purchase-money, and gift-money form the trinity in money circulation.

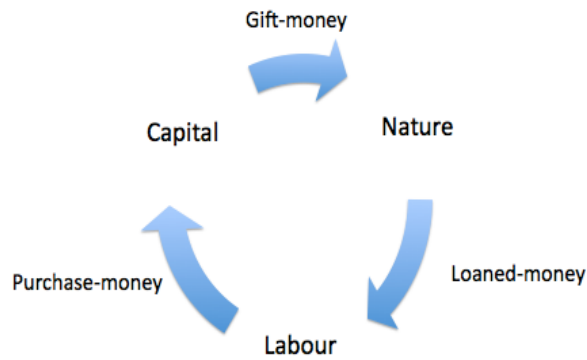


Figure1: Three types of money in circulation

It cannot be categorized that Steiner's theories belong to economics. He always insisted that not armchair theories but practical theories should be established by having strong imagination in order to know directly related people to the issues (Steiner, 1922). Terms, his expressions are difficult but will be understood in chapter 2 that entropy and natural circulation will be explained.

The Threefold Social Organism (The Social Threefolding)

In the 'World Economy' lecture, he proposed his own idea 'The Threefold Social Organism (or The Social Threefolding)' that the political pole of the state should be separated from one into three. The three poles to govern citizens are the governments of the economic life, the political life of rights and the spiritual-cultural life. In the economic field, economic association determine appropriated prices of commodities through consultation between representatives of consumers and producers. In spiritual-cultural field people discussed education, and the others such as a security issue are managed by the government of the political life. By realization of the

Threefold Social Organism, it will be possible that the interference of the existing authorities Gesell could not show resolutions will be conquered. It can be said that the concept of the depreciating money is a part of the Threefold Social Organism, which exists in order to realize it.¹⁰

There is a reason why Steiner said not the Threefolding Society but ‘Social Organism.’ Because, he perceived of society as a kind of life, which has its own organism as well as humans have. In his theories, all organic forms will someday die and go back to nature so if money will also disappear the wholesome society will recreate itself as a healthy organism.

So far, activism of the Social Threefolding has not been popular. Nowadays, only Philippine activist Nicanor Parlas organizes this type of activism (Towards Social Wholeness, 2011). This activism is just a web project in order to make people aware and invite supporters so it does not approach governments to change their political structures. Considering that practices of Free Money have been prohibited by the existing authorities, it is easy to imagine how long and hard way changing such a structure is.

Incidentally, Keynes, who understood Gesell’s theories precisely, resigned from his government post showing dissatisfaction with the contents of the Versailles Peace Treaty, which enforced the tremendous debt. Steiner introduced Keynes’ remark from

¹⁰ Christian Gelleri, a founder Chiemgauer and a teacher of social studies in the Steiner School has an intention to realize the Social Threefolding. See Appendix.

his book 'The Economic Consequences of the Peace (1919)' in one of his lectures (Steiner, 1919a). Keynes says, 'For the immediate future events are taking charge, and the near destiny of Europe is no longer in the hands of any man.' (1919: 278). Keynes was a man who predicted the possibility of the world war as a consequence no one being able to control the situation. Steiner was the man who warned of the consequences of the treaty. It could be argued that Steiner was also a man who could predict the future precisely.

1-3. Recent CCs in the world

There are approximately 5, 000 CCs in the world (Gelleri, 2009: 68). From these CCs, major examples, which have been successful regularly so far, will be introduced.

WIR

WIR, which means 'we' plus the abbreviation for 'economic circle', had begun as a CC issued by a cooperative Kreditgenossenschaft in Switzerland in 1934. Two years later, the cooperative obtained the bank certificate and became a formal financial institution. WIR is a membership system, which consists of over 60,000 small and medium-sized enterprises in Switzerland. The WIR Bank has issued WIR equal to over 8 billion Swiss francs for them (WIR Bank, 2010). The WIR Bank also does business in Swiss francs as well as normal financial authorities. On the other hand, the other local currencies, which were issued in the same period, became the means to meet a temporal need as alternatives to legal currencies. The WIR Bank loaned the local money to the

enterprises that had financial difficulties to enable them to operate their businesses and supported them in order to put the money into circulation amongst them (Ibid).

The mechanism of WIR shows in Figure 2. WIR does not exist as a paper bill but as a check and a card for settlement. Usually, WIR is used with the Swiss franc. The rate of interest in financing by WIR is around one percent, which is lower than by the Swiss franc (around 3.25 percent). Members (enterprises) that WIR is loaned use it for settlement with other members. The fee for exchange between members is around 0.8 percent of the amount of the exchange. In addition, members can order the commodities of other members from a catalogue that WIR Bank publishes. There is an index in the catalogue how much of WIR members can use commodities.

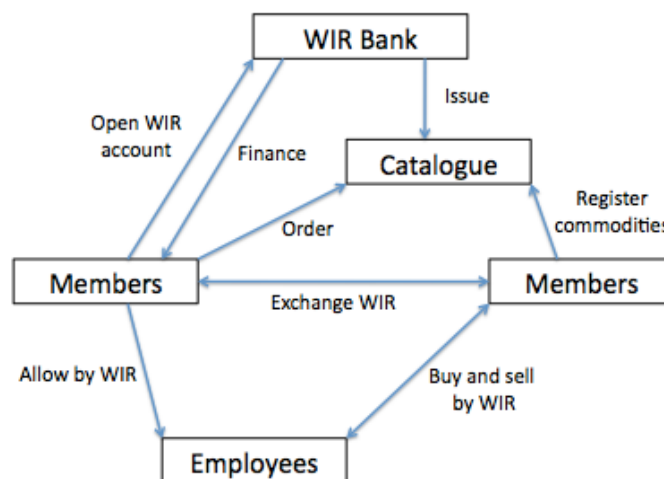


Figure2: WIR system (WIR Bank, 2011)

The problem is, however, that one third of the members practically do not utilise their WIRs. For these members, WIR Bank collects 80 Swiss francs as a fee from them if

their WIRs are not used for a certain term in order to ‘wake up’ them. This situation means that there are not places to circulate money and members save their money. The CCs except in the case of depreciating money often have this problem.

In the 1980s, the governmental inspection authorities queried WIR on whether a certain financial organisation was prohibited to issue a quasi-legal currency or not. After the discussion with the Swiss National Bank, WIR could continue to operate because the proportion of WIR in the total Swiss exchanges was quite small.

Time Bank

There is a simple service exchange system that uses time as currency. The rationale behind this is to build a community relationship by ‘spending an hour doing something for somebody in your community.’ (Time Bank, 2011). Time banking is a mutual aid system in which members exchange their abilities and time. Members obtain the ‘Time Dollar’ by volunteering for other members and can receive services in return. In the USA during the recession, there were hundreds of Time Banks and over 15,000 members (Epoch Times, 2010). A merit of Time Banking is that users do not only receive but also give services. One Time Dollar will provide for one volunteer per hour, and members use their Time Dollars to acquire various services: cooking dinner, acting shopping, house cleaning, driver service, repair of furniture, and many others. These services do not need to be taxed so it is the best system for those who do not have real money but are time rich. Even though there are some problems that have to be resolved such as a shortage of talented people, a strong merit of this system is that it strengthens

the social relationships in the community. By promoting Time Banking, spread of the ideal local community where people support each other will be expected.

Ithaca HOURS

During the 1991 recession in the USA, Paul Glover (1947-), an adjunct faculty at Temple University, created prototype HOURS as local currency in Ithaca, New York. Ithaca HOURS had begun with only 30 people (Ithaca HOURS, 2011). He continued to persuade people to use these bills and gradually the number of people who accepted it increased. A unit of Ithaca HOUR notes is ten dollars, because the average of salaries and wages in Ithaca is ten dollars per hour. With Ithaca HOURS, people can buy carpentry, childcare, nursing, electrical work, roofing, eyeglasses, food, gifts, and many other goods and services. One credit union accepts Ithaca HOURS for loan and mortgage fees. Ithaca HOURS have issued over 100,000 dollars since 1991.

Palmas

Palmas currency began in Palmeiras, a poor district in Fortaleza, Ceara, Brazil in 1998. In the district, around 32,000 people live in what used to be a shanty town. To improve their miserable lives, the autonomous association of Palmerias, ASMOCNP (Associação dos Moradores do Conjunto Palmeira) tried to rebuild the local economy by producing a micro credit in Palmas currency. The association produces services such as the micro credit for local shops and women, and a credit card 'Palmas Card', which can only be used in the district. New employment opportunities were created for over

one thousand people (Hirota, 2006: 3). As of 2011, there are 52 similar associations with Palmas in the whole of Brazil.

Basically, in the Latin American cultural area, the social movement Solidarity Economy (SE) is popular. Solidarity Economy, which has begun in 2007, is an emerging social and economic movement designed to protect poor and indigenous people from the neoliberal economy. Palmas are integrated in the policies of SE. The current president of Brazil Dilma Rouseff pledged to consolidate the integration of the National Policy of Solidarity Economy with the country's sustainable development strategies at election times. The SE movement expanded to the national level.

Hanbat LETS

In Korea, there is a LETS (Local Exchange Trading System¹¹) style currency. In 2000, in Daejeong, Hanbat, which means a big field, began with the aim of creating an autonomous community and to be a pioneer to demonstrate how to build a sustainable community as a part of UN Agenda 21 (Chun, 2006: 5). Hanbat LETS is a mutual-credit association. At a clinic of a Korean herb medicine, people pay medical expenses by Duru as the unit of the LETS point. For this service, people who have a difficulty to pay by the legal money because of a low income can receive sufficient medical services. In addition, Hanbat LETS can be used through a handcrafting school, a music school, IT teaching, a dinner party and other such services (Hirota, 2006: 5-6). In the beginning, the number of members was less than three hundreds but by 2005 it was over 4,700

¹¹ This system is to provide a local information service and record transactions of exchanging products by using its currency.

(Chun, 2006: 8). It succeeded in earning around 65 million Duru. In total with exchange in won, it is around 121 million won (Ibid).

Totnes Pound

In 2007, local currency Totnes pound started in Totnes, which is famous for being a Transition Town (Transition Town Totnes, 2011). Their aim is not just to protect the community from the globalised economy but to achieve relocalisation. According Hopkins, a pioneer of the Transition Town movement, ‘given the scale of challenge presented by peak oil, and the degree of urgency in the rebuilding of local resilient infrastructure, likened by some to a “wartime mobilization”, we felt Totnes needed more than LETS.’ (2008: 197). This project is just a beginning and the amount in circulation (6,000 T-pound) is a small proportion of the Totnes economy (about 0.01%) but contributed to raise awareness of the need to buy local products (Banks, 2010: 39). Nowadays, over 70 local establishments accept the Totnes pound. Brixton and Lewes follow the Totnes example, issuing their own currency while there is also the need to raise awareness about local economy among shoppers and businesses (Ibid: 26).

Chiemgauer

A depreciating money Chiemgauer, which was created in a health resort Prien am Chiemsee, Bayern, Germany in 2003, is steadily spreading. The project of the Chiemgauer was begun by Christian Gelleri, a teacher of the Wordolf School (Steiner School) and the graduates. Nowadays, approximately 440,000 Chiemgauers (one Chiemgauer is equal to one Euro) have been put into circulation (Hirota, 2009: 1).

Chiemgauer's demurrage-fee (=negative interest rate) is 2% per quarter or 8% per annum. People can exchange Euro into Chiemgauer at around 50 issuing offices. As a bonus, people can choose a non-profit project that they would like to support, which gets three percent of the exchange (Figure 3). This system contributes to motivation because people can think that they are doing a good thing by exchanging into Chiemgauer. On average, around 2,500 consumers exchange 100,000 Euro into Chiemgauer per month (Gelleri, 2009: 71). In other words, around 3,000 Chiemgauer contributes to non-profit-projects each month or 36,000 per annum (Ibid).

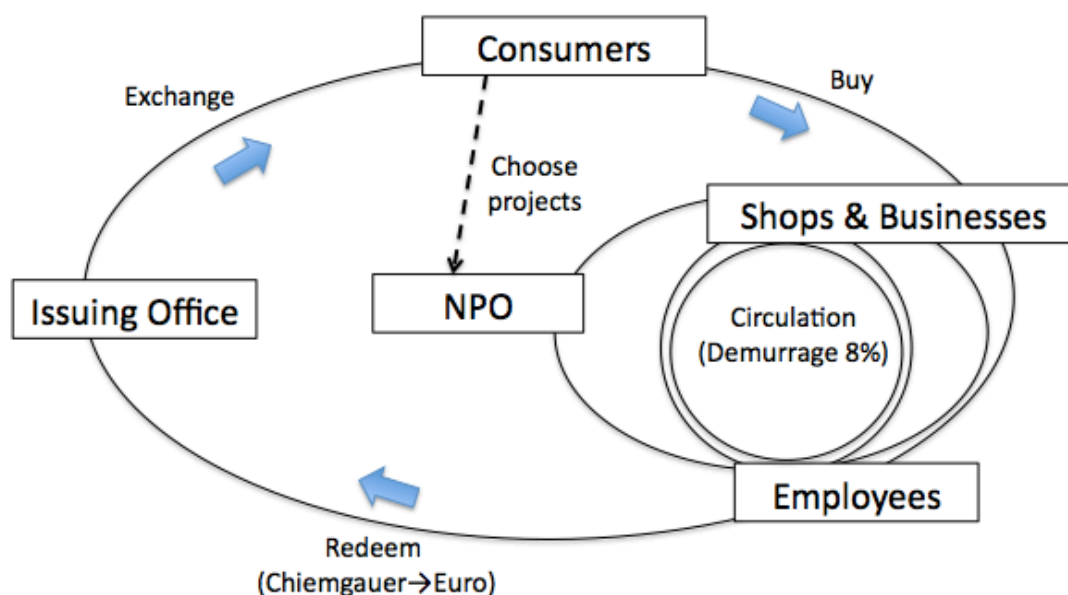


Figure3: The Chiemgauer Currency Cycle (Gelleri, 2009)

Considering consumers and shoppers' best way of using Chiemgauer for profit, continuing to spend it is the best because they do not need to change Chiemgauer back

into Euro again. When a shopper has too many Chiemgauer, she can change it back into Euro again but has to pay a 5 percent fee. For instance, if 21 Chiemgauer is changed back, only 20 Euro is paid back and 1 Chiemgauer goes to the non-profit organization. After that, the issuing offices sell the Chiemgauer again. The offices sell 100,000 Chiemgauer per month and 98,000 are back per month so the circulation increase by 2,000 Chiemgauer per month (Gelleri, 2009: 71).

The founder of the Chiemgauer, Gelleri does not prefer that money be used of hoarding and speculation. He shows that in the total world trade in goods and services with foreign exchange trade in 2007, only 1.2 percent of all money is used for world trade while 98.8 percent is used for foreign exchange trade. (Gelleri, 2009: 62). On the other hand, in 1977, 10 percent of money was used for world trade (Ibid.). This means that the velocity of money, which is the actual circulating speed of money has been decreasing for 30 years (Ibid.). This problem is a peculiar feature of the today's monetary system. The reason that one third of WIR has not been in circulation is the same (Gelleri, 2009: 66). Conversely, the Chiemgauer does not have this problem because the velocity of the Chiemgauer is three times as fast as legal currencies as the result of needing to use it before its face value depreciates (Ibid: 64). In order to develop the practice of depreciating money, a group of Gelleri's will be holding an experiment in Munich to ascertain whether the depreciating money can work in such a big city because as yet there have been not examples that the CCs were adapted to high-complex societies.

In addition, there are more successful examples. For instance, the non-government organization STRO, whose headquarters are in Holland, puts a local currency, the Gota Verde in Honduras that uses bio diesel oil as collateral. In Uruguay, there is a project called C3 Uruguay that finances to small businesses in the local currency in order to support them (Hirota, 2006: 6).

To sum up, characters and systems of the CCs are various, while most of the CCs are basically recommended in order to protect local communities as part of an anti-capitalist movement. However, as it was stated in the introduction, Free Money (depreciating money) does work permanently. In the next chapter, how Free Money adapts to the law of nature will be explained.

2. The Understanding of Free Money

2-1. Entropy Law and Sustainability

Entropy law

To understand Free Money, the today's monetary system needs to be analysed with reference to capitalism is pointed out. A lot of people are still prone to think that technological innovation will overcome some current difficulties of society in the world as well as they had been overcome in the past. They even assert that innovation is the essence of capitalism and is the best path of human development (Bowles, 2007: 27). However, in this chapter, this idea will be critiqued using the explanation of the law of entropy.

Entropy is an index to show the extent of substances and thermal energy in accordance with the famous second law of the thermodynamics. Entropy is an irreversible law that a spread state will not be restored when time has passed. In similitude, 'a broken piece of glass will never be restored.' The images of entropy are shown in figures 4 to 6. First of all, there is matter (or energy) in the centre of a space (Figure 4). Entropy is 'low' in this condition.



Figure4: The Law of Entropy I

After that, as time passes, the matter spreads. Entropy becomes 'high' (Figure 5).

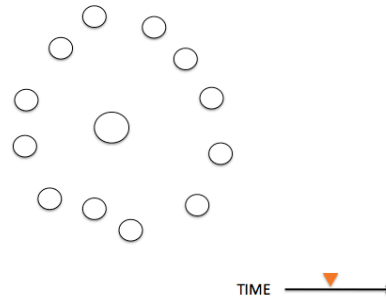


Figure5: The Law of Entropy II

The more time passes, the more entropy increases and spreads (Figure 6).

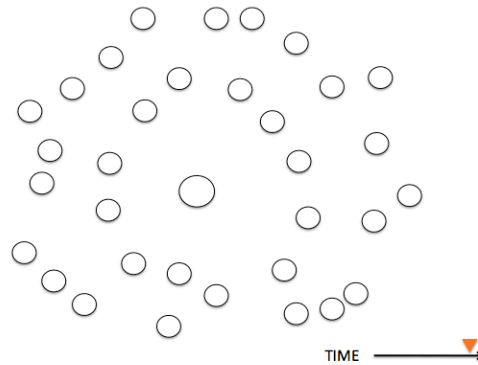


Figure6: The Law of Entropy III

It can be said that the matter has finally become chaos. Short of reversing time, the spread can never be restored.

A famous example to demonstrate this concept is oil. (Figure 7). Initially, there is petroleum somewhere in the earth (its entropy is low). Then it is pumped out and refined into heavy oil, light oil, naphtha and others (entropy increases). Next, it is

processed into plastic products, regular gasoline and others (entropy is high). In this process, the properties and even the locations of the oil have changed variously. When

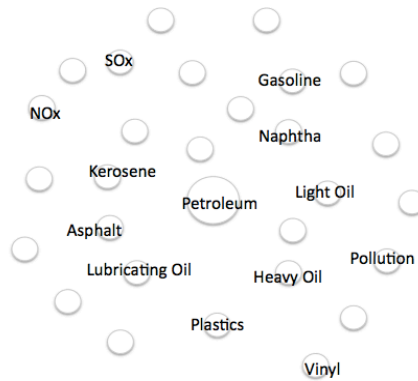


Figure7: Spread of Petroleum

entropy law is not considered with the perspective that these products are useful to humankind, some pollutants that are provided through oil processing are merely one of the spread matters. Some people perhaps argue that recycling decreases entropy. However, recycling means that humankind creates a new matter by renewing old because new energy is added by human activities. Recycled products are completely new in which conditions become chaos. Under the first law of thermodynamics, if recycled products are exactly the same as the old, the amount of energy that is used through the process to recycle should be equal to the old process. There is an image of the drawing circle in which the products are integrated in the process of production by human activities and it seemingly circulates permanently but entropy is increasing. Another example, nuclear power is often introduced as the alternative to using fossil fuels in order to generate electricity. Nuclear power plants have high efficiency benefits over thermal power plants but produce nuclear wastes as by-products. Under the law of entropy, the by-products change into, for instance, depleted uranium ammunition in order to use in war. It is certain that the nature of oil and nuclear power is the same

under the law of entropy. Unless free-energy technology is established, human activities must obey this law.

Sustainability

Nowadays, the peak oil discussion awakes people into changing their focus towards a more sustainable society (Nelson, 2007: 52). The Fukushima nuclear plant accident has also shifted people's mind to aiming for a better society. Considering the entropy law, however, it is directly unrelated to whether peak oil is coming or not, or whether a nuclear power plant is dangerous or not. The problem is that these spread matters (products and by-products) cannot help spreading toward the condition of higher entropy in a closed physical system such as the earth (Figure 8). It is necessary to

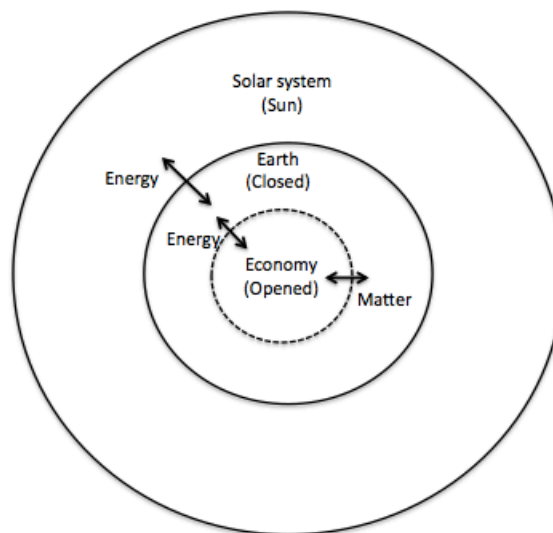


Figure8: Hierarchy of physical and economic systems
(Revised from McMahan and Mrozek, 1997: 503)

mention that matter itself exists within a closed system while energy goes out. As matter, human beings cannot stand if the earth does not exist. Rather, we cannot exist if we do not take in nourishment as food from substances that the earth produces. Because

of the limit of the earth, all matter based on the earth, which includes human beings, exists within a closed system. Entropy can never decrease. Practically, ‘even though energy is conserved in physical processes, entropy is degraded into less ordered, and less useful, forms, which are said to possess higher entropy.’ (Barrow, 1998: 142-143). To achieve sustainability is to restrain the spread under the entropy law while people are prone to misunderstand the meaning of sustainability that can be realized even if entropy increases because technology can go beyond the current limit of human activities.

2-2. Limit of Technology

Incompleteness Theorems

To support and develop the understanding of entropy law, a theory that relates to the limit of technology should be introduced. In 1930, the Czech logician Kurt Gödel (1906-1978) proposed the theories concerning the limits of formal decidability-bound technology that developed from scientific knowledge involving the whole of mathematics. These theories are called the Incompleteness Theorems and can be summarized in the following.

‘Any formal system T that is:

- (a) finitely describable
- (b) consistent
- (c) as strong (rigorous) as Peano arithmetic¹²

¹² Peano arithmetic is a theory of natural numbers defined by Peano axioms that are a set of axioms for

is subject to two limitations:

Theorem 1: *T* is *incomplete*, i.e. there will be some statement about the addition and multiplication of natural numbers that can neither be proved nor disproved by *T*.

Theorem 2: *T* is *unable to establish its own consistency*, i.e. is unable to prove that no contradiction can be derived from *T*.

(McMahon and Mrozek, 1997: 509).

In short, the Incompleteness Theorems means; every theoretical system certainly has a proposition that cannot be proven. In other words, it is impossible to prove that the theoretical system has no contradiction within itself, so the system completed by itself does not exist logically.

According to Rucker, mathematics is endless, and there will always be undecidable problems formally (1995). Therefore, ‘science, which makes use of the whole of mathematics, will never have all the answers.’ (McMahon and Mrozek, 1997: 509). Hence, technology developed from scientific knowledge involving the whole of mathematics will never be perfect. It can be said that technology just ‘seemingly’ solves problems but creates other problems. Rather, it will make matters worse such as today’s nuclear power technology. The technology to kill radioactive substances does not exist so people merely keep them underground for people to deal with in the future. There is no guarantee that people will invent a perfect technology. Additionally, considering the disaster of the Fukushima nuclear plant, which occurred due to the magnitude 9.0

the whole natural numbers. Italian mathematician Giuseppe Peano (1858 -1932) presented in the 19th century.

earthquake on 11th March, 2011, four nuclear reactors were damaged by the combination of the earthquake and tsunami. The problem is that there was the strong possibility that steam leaking from the reactor, which included radioactive substances, was certain because the no.1 reactor vessel or its appurtenant pipes had already been damaged before the unexpected tsunami — it should have been expected — hit the plants, though the level of the earthquake was not beyond its quake-resistance strength (The Japan Times, 2011). Although this huge disaster happened, the company that owns the nuclear technology continues to sell it overseas, advertising that the current technological flaws will be overcome in the future (Bloomberg, 2011). Arnold Gundersen, energy advisor with Fairewinds Associates Inc., which produces up-to-date precise information of the Fukushima disaster, said, ‘sooner or later, in any foolproof system, the fools are going to exceed the proofs.’ (If You Love This Planet, 2011). The Fukushima nuclear plant disaster, which was started by an earthquake, is nothing but an artificial disaster created by humankind that only has incomplete technology.

Economic Growth and Technology

Considering economic activities in a closed system (the earth) while entropy increases, environmental destruction is a typical problem. The problems that cannot be solved will always exist, so unsolvable problems will happen in the economy-environment interactions (McMahon and Mrozek, 1997: 502). Oil processing produces toxic gasses into the atmosphere, and nuclear power plants produce nuclear wastes to which only solution is keeping underground semi permanently in order to protect us and the environment. It is possible that economic growth can continue without environmental

destruction as long as technology is perfect and entropy is irrelevant to the use of natural resources in economic activities. However, the reality is that there is no perfect technology, and our world is already saturated with humankind's gross activities as the "Limits of Growth (Meadows, et al., 2004)" suggests.

Nowadays, ecological technology is becoming popular. An alternative society that uses sunshine in order to manage and reduce entropy like the natural ecosystem is required. This technology means, in short, that society gets energy directly from the sun as well as a plant does. The problem to realize is how much resources to utilize for equipment to absorb the sun energy is available. Although the technological development of using titanium or other alternative materials efficiently has improved, used resources have to be fully restored in order to realize the perfect ecology like plants when they die and return these materials into the soil. However, there is not perfect technology. Moreover, when resources are restored again, which means the relevant technology must obey two thermodynamics laws, it can be compared with that asphalt changes crude oil by using the sun energy without any other energy source. Is it possible for humankind to do so? Can humankind disprove Incomplete Theorem, even within the 50 years that the earth's capacity is reaching its limit as it is?

2-3. Economics and Entropy Law

Economics ignores Entropy Law

The essence of capitalism, which is the dominant economic system, is technological innovation and initial investment. If the perfect technology of free energy has to be

established within 50 years under capitalism, the today's chronic recession in technologically advanced countries should be conquered. However, discovering solution is very difficult because economics which analyse human activities through money exchange, ignores entropy law; i.e. 'conservation of energy and materials, demonstrating conditions under which prices, indicating the preferences of rational economic agents, accurately reflect resource scarcity, and conditions in which markets efficiently allocate scarcity.' (Mcmahon and Mrozek, 1997: 502). These resources will be used up by human activities. Then humankind must consider what they should do when these are lost.

In economics, resources on the earth are regarded as natural capital (O'Hara, 1999: 779). Presumably, natural capital seemed unlimited because people could not previously imagine in what conditions they lived. In the optimal macroeconomic scale, economics did not consider that this capital existed in a closed physical system but merely relied on the condition of entropy being low. According to Barrows, it is important to understand that 'the 'arrow' of entropy increase is a reflection of the improbability of the initial conditions which are entropy-decreasing in a closed physical system.' (1991: 38-39). It can be said that modern economics pays insufficient consideration to these 'initial condition.' It is not surprising that the fact of the earth being a closed physical system was not known to people in the Age of Discovery when early economics began to be established. However, probably until the time that Gesell and Steiner advocated the depreciating money, economics had to recognize that the world was a closed system for humankind. The time it actually began to be considered, however, was in the 1970s

when Georgescu-Roegen repeatedly suggested that the standard economics considered the economic system as completely self-sustaining and circular, which means that interaction between consumption and production is done only within a completely closed physical system (1970: 53-60). Besides, this suggestion was the beginning of the discourse not about finding solutions but how human activities overcome the resource scarcity through the technological innovation in order to restrain entropy-increasing. The monetary system itself was not considered. Recently, Swedish scholars Kåberger and Månsson considered the relation between economics and entropy, concluding that 'Even in the long run, entropy production associated with material dissipation need not be a limiting factor for economic development. Abundant energy resources from sunshine may be used to recover dissipated elements.' (2001: 165). Many people have to think this thought unrealistic from the common understanding of the world situation. Kåberger and Månsson's hypothesis means that old products can be restored to use by adding new energy, and these will be re-integrated into circulation of economic activity so entropy law need not be considered. However, technology is limited and improved technology will produce new problems. Technology always has problems. Their conclusion will be acceptable in an ideal society that some people vaguely believe might come in the future but will NOT come under the technology based on scientific knowledge as Incomplete Theorem indicates (plus the today's monetary system that will be explained in 2-4). In the first place, if a perspective of metaphysical understanding is accepted, it can be said that harmful influences, which are a result of the incompleteness of technology, are the results of entropy-increasing. Because, for instance, if nuclear technology does not exist, the problem of the radioactive

contamination would never have existed. Only in the world where influences of entropy-increasing are overcome, their conclusion that entropy production need not be a limiting factor will be realized.

No Externality

All over the world, there are many conflicts of scrambling resources that are running out nowadays. For example, conflict over water is a serious problem. In the Mekong River, which flows from the Yunnan Province, China to the South China Sea through the east south Asian countries, governments built hydroelectric power dams in the many branches what they want in order to gain economic profit regardless of other countries' interests, the dawn stream regions were under water shortages, and then agriculture and agricultural lives in Vietnam and Laos were seriously suffered (Mekong Watch, 2011). This is definitely the result of every government not considering externality in economics. Governments mainly planned to store water and create electricity for urban people (internality), and did not care about the other things (externality). However, there is no true externality in the earth as a closed system. It can be said that humankind conveniently creates categories where they want to act in the fields of business and studies in order to separate internality and externality. (Under the perspective of metaphysical understanding, the above example can be translated in to the following; when the existence of hydroelectric power dams is applied to entropy law, not only the fact that water, which originally flows from upstream area to downstream, is forced to change routes in order to transport to urban areas and supply electricity to urban

citizens but also the fact that ‘water does not flow to the original downstream’ means entropy increases and the situation becomes chaos.)

Although the problem of sustainability is often discussed, it seems that fundamental matter is forgotten. Perfect sustainability is essentially to suppress entropy-increasing perfectly as well as nature does. Is that possible? Does the international community think that ‘sustainable development’, which is basically a contradiction in itself, is possible regardless of the entropy law and its application to economics and the economic system? Simply, this is a discussion in the world of political dynamics that advocates the development possible. It is just seemingly possible. If economics continues to ignore entropy law and the truth that the earth is a closed system, the role of economics will be merely to consider the distribution of some resources and attach values, whether it is useful or not for humankind.

2-4. Money and Entropy

Money in a Closed Physical System

Considering the relationship between money and entropy, what is the outcome when economics adapts to entropy law practically and considers a closed physical system of the earth as the initial condition? By thinking in this way, the fact that the today’s monetary system is necessarily incompatible with entropy law will be realized because **money continues to increase in a closed physical system.** Actually, increased money stops circulating in a real society and moves to the virtual world such as speculation in a stock market. In other words, increased (surplus) money can no longer exist in a real

society. These are the nature and problems of the today's monetary system in considering entropy law. Increased money contributes to the creation of new financial instruments like a Credit Default Swap (CDS) as a consequence of seeking — society cannot help seeking — technological innovation for alternatives in the world of speculation. The CDS is a swap contract and agreement to exchange default risk. The protection buyer of the CDS makes a series of payments to the protection seller, and receives a payoff in exchange when a credit instrument experiences a credit event. For instance, a gigantic insurance company AIG, which had the total market price of 200 billion dollars, had the CDS operation of 400 billion dollars but became a default on an obligation in the times of the Lehman Shock, and in the long run was supported by the Federal Reserve Bank (Lanchester, 2010: 60-65). The financial instruments CDS can be regarded as a matter that entropy increases as a form of the risk dispersion, and one of the technologies that must obey the Incompleteness Theorems. The other economic 'inventions' such as CLN (Credit Linked Note) and CDO (Collateralized Debt Obligation) are also merely things that spread under the entropy law. New derivatives will continue to be invented in the future. These inventions will merely continue to increase and even create some new problems. It can be said that these are kinds of cancer cells because the cells continuously increase while normal cells are renewed regularly. Do people live with the cancer in the today's society?

Recently, the crisis of the USA's default has been repeatedly warned about. Every time that an upper limit of debt occurred, Congress made the agreement to reset the limit. However, it cannot be reset forever. When the international community decides to

abandon the system of the dollar as key currency or works out some solutions — although these just seemingly are solutions — in order to stabilize the world economy, the USA will perhaps declare default. In 2006, a famous economist Joseph E. Stiglitz proposed a kind of supranational currency that he called ‘global greenbacks’ from regret that he could not resolve the distortion of the world economic system as the realization of the American hegemony when he was the Governor of the World Bank. His concept of the global greenbacks is similar with that Keynes called ‘bancor’ in the early 1940s (Stiglitz, 2006: 260-265). Introduction of the greenbacks will make the decision-making process for the proportion of countries’ influences difficult. If international community makes the agreement — if not, the world will just become unstable — in order to restart economic development under the new political and economic order, does it mean that the world shift the course toward restraining increase of entropy? No, entropy will continue to increase. Moreover, considering Incompleteness Theorems, is the problem of unemployment in developed countries that these rates will largely be estimated to keep approximately nine percent solved? (Global Times, 2010). Probably, in the transition to the supranational currency, new political and economic disorder will occur.

Money in Natural Circulation

To restrain entropy-increasing, the only way is through money disappearing. To vanish money in a closed system, Free Money is really necessary. For the deep understanding of the concept of Free Money, the concept of natural circulation will be helpful. Natural circulation realizes semi-permanent sustainability of an ecological system by utilizing

energy from the sun. To circulate Free Money is to establish the natural circulation with consideration of the entropy law.

Circulation of the today's monetary system is shown in Figure 9. Businesses implement the initial capital investment for a new project by taking a loan from banks. As the outcome of the investment, the businesses sell new products and consumers buy them. The businesses obtain profit and banks collect their loan with interest. Again, businesses take a loan from banks. Because the today's currency does not disappear, the amount of money in circulation continuously increases. This is the cause of inflation that cannot structurally be solved. In addition, increased currencies go into speculation, circulation in real society piles up, and then the velocity of money decreases, like the blood circulation of a human body clogging up.

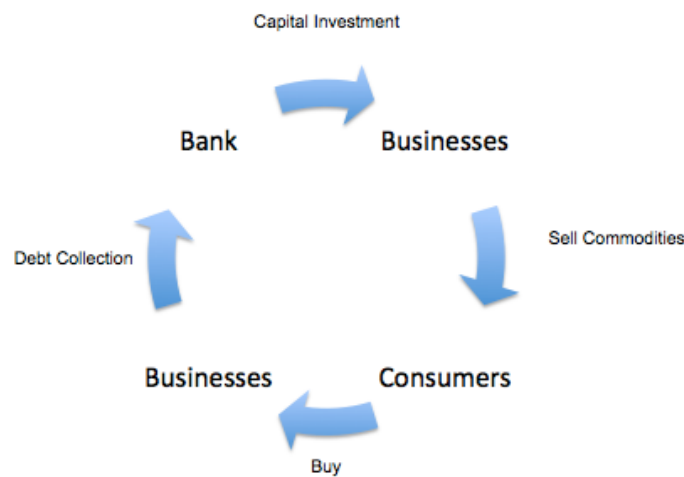


Figure 9: Money in circulation

If money disappears, Figure 9 will be the same as Figure 1 that Steiner suggested. If not, there will be only loaned-money and purchase money in this figure. There is not

gift-money (Free Money). Unless the loaner (a bank) renounces the right of debt collection, this figure will not become the same. Thus, only when the interest rate becomes minus, will circulation be established. In the contemporary system, money circulates because the interest rate is largely positive and people think that they must return debt with interest. On the other hand, in a system which the interest rate is negative, money circulates because people think that the money will disappear after all if they do not use it for long time, while in this case, people spend money only they need to. By using Free Money, people no longer accumulate permanent wealth in daily live.

Free Money satisfies conditions to adapt to entropy law. Other complementary currencies that do not depreciate cannot adapt. They probably have the same problems with the official currencies such as inflation and decreasing velocity of money circulation.

3. The Relationship between the CCs and Autonomy through Recent social Movements

3-1. CCs as the Unit of Local Autonomy

To consider the relationship between the CCs and recent autonomous movements, the unit of local autonomy should be mentioned. Each country except those in the Euro zone has an official currency. While control of the currency is the role of the government or the central bank, local governments cannot decide the amount of the annual money supply in the regions. Also, when their government makes war on others for reasons of national security, some people perhaps feel guilty a little to use the official currency because they think that by doing so they support the war. People cannot help feeling resistance to using the currency. Moreover, in the Euro zone, a harmful influence caused by currency integration is noticeable such as Greece crisis (BBC, Jun, 2011). In this situation, it would be inevitable that autonomous movements to attempt to establish the CCs had become popular. Usually, in each region, there is an assembly that can enforce a local ordinance. Then, it will be natural that each local government issues its own currency.

According to Greco, the fundamental advantages of the CCs are:

- ‘1.They can be spent only within the limited area of the community.
2. They can be created locally in accordance with the needs of the local economy.
3. They encourage local people to patronize one another rather than buying from outside the community.’

(Greco, 2002)

The first advantage contributes to protection of the community because consumers spend the currency only within the community because it cannot be used outside. Official currency can be used freely to purchase commodities and services outside so money that flows out cannot contribute to the local economy. The second makes it possible to control the local economy by making decisions about the money supply on their own. The third restores the relationship between local communities because buying and selling between local people will increase. Nowadays, increasing dependence upon entities of impersonal politics and economics has caused the disintegration of traditional social structures: the family, the village, and the bioregional community (Greco, 2001). The CCs will resolve this problem.

Considering human greed, it is possible that people who rule could chop and change between the CC and official currency irregularly try to collect a fee more than necessary. Additionally, people perhaps prefer the official currency or gold to the CC as the medium of saving and speculation because they consider the exchange troublesome. These tendencies of human beings should be conquered. Although the tendencies will not change only by the introduction of the CCs, it will be a worthwhile step to conquer them and move toward a better society.

Chronic reliance upon official currencies and the competitive conditions of the global market influence all communities to slight people's working conditions and environmental quality (Greco, 2002). However, the CCs will provide 'a buffer' that

allows autonomous communities to set their own standards and realize a high quality of life (Ibid). In addition, if the CCs are circulated sufficiently to sustain local economy, it will be ready for a steep fall of the official currencies' values in the case of financial breakdown. The CCs can protect the values of local commodities and services by changing the exchange rate to the official currencies if local people trust the values of the CCs. Of course, a normal local currency also causes inflation and the decrease in velocity of money as well as the official currencies so Free Money should be adapted to local communities in order to realize autonomy permanently, not stop social disorder temporarily.

From the very beginning, the word autonomy means 'self-rule' rooted in the Greek words. To have the CC as the unit of autonomy is not against the concept of autonomy. The problem is, however, many local authorities rely on grants from central government while local revenue is limited. The British government has a policy to cut central funding to local authorities by 28 percent over four years (BBC, Dec, 2010). In Bradford, the local government faces a budget reduction of over 7.6 million pounds and has to reduce many public services (BBC, June, 2010). It can be said that the purpose of introduction of the CCs is to change the heavy reliance on central government.

3-2. Transition Town, Permaculture and Solidarity Economy Sustainable Life

The explanation that Free Money adapts to entropy law and functions permanently in a closed physical system was covered in chapter 2. Likewise, social movements in which

the whole community and lifestyle adapt to entropy law are the Transition Town (TT) project and permaculture. The TT is a social movement, which began in 2005, in order to realize sustainable community in the whole town. Nowadays, there are over one hundred projects of the TT in the world (Transition Network, 2011). Permaculture, which is integrated to the TT, aims at human activities existing alongside nature by reconsidering fundamentally agriculture, food (edibles) and lifestyle. It ultimately means the realization of a truly sustainable life that restrains entropy-increasing.¹³

The TT includes various studies of, for instance, psychology, the ‘wiki’ approach to collaborative information building, resilience, learned optimism, and the permaculture concept, and attempts to create alternative communities in the fields of economic structure, social systems, and physical infrastructure (Banks, 2010: 7-8). The birthplace of the TT, Totnes succeeds the projects with full support of the local government, and the local citizens there can participate in some projects with a common sense of autonomy in order to realize a sustainable life. On the other hand, permaculture is an ‘ethical’ design for a sustainable lifestyle by caring for the Earth and people (Lillington, 2007: 24). It explains the importance of combining ethical values with deep understandings of nature. For this reason, people who devote themselves to it do not accept neoliberalism. Hence, when we consider achieving the real ‘sustainable life’, not ‘sustainable development’ that the international community advocates, it will not be realized unless the today’s monetary system is fundamentally changed.

¹³ Incidentally, the ultimate goal of permaculture is to improve soil nourishment, while traditional agriculture sustains it and mono-agriculture decreases. The deep origin of permaculture philosophy partly has been developed from the works of Japanese agricultural scientist Masanobu Fukuoka (1913-2008). By reading his book ‘The One Straw Revolution (1978),’ we will know its improvement possible.

Ecological Citizenship

To achieve the realities of the idea of the TT and permaculture, a reduction of reliance upon official currencies and markets is necessary. On a personal level, people should be free from the consumerist mentality, distinguish real needs from luxurious things, eliminate expenditures that are induced by fear, have more diversified skills and abilities, learn to do-it-yourself, and develop mutual support relationships with others who have like mind (Greco, 2001). On the local community level, a local authority has to take stock of their own resources and make an effort to reduce the amount of value imported into the community by substituting local commodities for imports and reducing their need to make money by selling exports (Ibid). Local citizens' participation — participative action to all people in all areas of life and environment — is a key to achieve this. The citizenship that makes an effort to practice this is called Ecological Citizenship (Dobson, 2003). According to Seyfang, ecological citizens have 'obligations as a justice-based account of how we should live, based upon private and public action to reduce the environmental impacts of our everyday lives on others.'(2006: 388). In other words, ecological citizens' ethics are based on their willingness to obey the law of nature and is against consumerism, which exists within the today's economic circulation. If people have only consumers' minds, they merely think what they want for their own profit. Ecological citizens are required to have a mind of making a living considering profit for the whole community. Decisions to buy something should be made according to 'citizen' rather than 'consumer' interests (Ibid: 387). They will make an 'ethical' choice in order to protect their community.

And now, turning to Free Money, people who have a mind of ecological citizenship deserve to accept its concept and practice it. At least they will accept it easier than those who would like to become richer than anyone else. The concept of Free Money should be integrated into the autonomous movements. The Totones Pound, which has been practiced through the TT project, does not depreciate. In a very small scale of trading such as direct exchange between individuals the CCs do not need to depreciate because the CCs in this case actually mean deposits in themselves and no one can accumulate permanent wealth. Time Bank is also unnecessary to have the Free Money because people know their faces each other. However, when the economic scale becomes bigger, — as it did after the specialization of labour as a result of the Industrial Revolution, the usual economic scale is big enough — Free Money has to be adapted by the community.

Anti-neoliberalism

In Brazil, the Palmas currency operates under the full support of the central government as a pledge of the cabinet. This is a rare example where the local and central governments and local inhabitants cooperate with each other in the Solidarity Economy (SE) although they do not always keep a good relation¹⁴ and because the micro credit paid by Palmas is not depreciating money, it does not work permanently. The reason the policy of the SE can be consistently promoted by them is that powerful enemies,

¹⁴ The Palmas Bank was sued by the central bank but won the suit so the current relationship was established. The cooperation is operated through National Secretary of Solidarity Economy at the Ministry of Employment and Labour.

who advocate neoliberalism, exist so that the great common purpose, the protection of the nation, can be created. On the other hand, in developed countries where central governments are exactly neoliberalist or influenced by it and often make its policies, it is difficult for local governments to obtain support from the central governments. In fact, as examples such as Schwankirchen and Wörgl demonstrate, no sooner did practices of the CCs seem successful than the prohibition of them by contemporary authorities was ordered in order to protect their vested interests.

Solidarity in autonomous communities can be strengthened by adapting the CCs. However, when the currencies are not Free Money, wealth will be accumulated permanently. If developing and emergent countries no longer become second-class, it is possible that they pursue wealth endlessly operating in speculation as well as ex-developed countries did. As some argue that an economic hegemony has already been shifting from the USA to China, China perhaps will be the new centre of neoliberalism under the name of the leader of the world economy. Brazil should not become so. It is necessary to realize sustainable life, not by pursuing an economic advantage over the others but by forming a strong and 'ethical' autonomy by adopting Free Money.

Conclusion

The understanding of the CCs, especially Free Money, is significant for the achievement of the local autonomy as the appropriate unit. Moreover, the CCs are capable of assisting a society to transit toward an alternative society without negative effects such as economic disasters, and resource conflicts. Free Money will be a permanent exchange tool in order to realize sustainable life in society in that its nature of currency obeys the entropy law.

Nowadays, the only successful example of Free Money is the Chiemgauer. The spread of Free Money- type CCs is necessary in the world except on a small economic scale such as the barter system because the normal CCs do not work permanently. If there is a case that Free Money is not required in communities, it means that the official currency and all other currencies, which relate to the official in exchange, are Free Money-type currencies because no one can accumulate wealth permanently by using these currencies in circulation. So far, the social movement of the CCs is at a grassroots movement level. Participants in the movement should consider a successful business like the Chiemgauer. For instance, if the local government supports the project, it would be a good idea for local public employees' salaries to partly be paid in the CC; if the minimum expenditure in a month is 200 pounds, only the amount of the CC that is equal to 200 pounds should be given. If so, the local government will not need to cut services and the like because 200 pounds per person can be saved.

It is possible that the CCs will gradually spread because the reliance upon the official

currencies is decreasing. For instance, in Spain, which belongs to the Euro zone, there is a small town in which the old currency, the peseta is used in order to lift the local economy (BBC, May, 2011). In this case, the old currency actually becomes the CC. It is obvious that economic and monetary union in Europe has not gone smoothly. Perhaps, the concept of the Social Threefolding also will spread because the reliance upon the current political structure is becoming unstable. Rather, it seems that the current world situation demands the right ideas.

Every time and everywhere, there are causes of the social problems. In our time, the causes would broadly be capitalism or neoliberalism but, as this dissertation pointed out, the cause is the monetary system itself. For the spread of Free Money, detailed plans such as the charge for exchange, its rate, the annual supply, and the trade methods must be considered as well as what the place, culture, lifestyle, and economic scale may demand. Keynes said ‘the actual charge [...] which would have to be changed from time to time, could only be reached by trial and error.’(1936: 357). Practically, many trials and errors have to be experienced.

Probably, some people are skeptical about the concept of Free Money. They probably argue that running the money, which cannot be accumulated wealth permanently, in circulation is impossible because humankind’s greed is limitless. However, when people will be free from money, perhaps these ideas will change. ‘If money is liberated, commerce will be liberated; if commerce is liberated, the people will be empowered to the full extent of their abilities to serve one another.’ (Greco, 2001). To think of ethics

and morality, and to truly care about other people, the today's monetary system should be changed.

Postscript

The existence of the literatures about Free Money that are used in this dissertation are very rare. Probably, only has the University of Bradford these literatures. The reason of its existence is that the New Atlantis Foundation¹⁵ donated their collection. Dimitrije Mitrinović (1887-1953) who is a Serbian philosopher is also a revolutionary and a major contributor to the radical journal ‘New Age,’ writing a column on world affairs (University of Bradford, 2011). Between the two world wars, he was concerned with ‘organic’ world order and formed the New Europe Group in order to establish European federation and a re-evaluation of European culture in the 20th century (Ibid). His activism is definitely categorized into the spiritual movement as the current of New Age such as Anthroposophy¹⁶. Strangely, in Büchi’s book ‘Free Money’, he mentioned the ‘organic’ state, which is put forward by the New Europe Group and confessed that he was indebted to them for the realization of what he had been dealing with in the contents of his book (Büchi, 1933: 196-197). The word ‘organic’ they mentioned definitely comes from Steiner’s word the (Threefold) Social Organism. Additionally, while the insistence that economics has to adopt the law of entropy was done in chapter 2, the insistence had already been done by Frederick Soddy (1877-1956), who was an English radiochemist and a winner of the Nobel Prize in 1921 for proving the existence of isotopes of certain radioactive elements. Sadly, his theories were ignored and ‘he was roundly dismissed as a crank.’ (Zencey, 2011). Actually, Soddy participated in the New Europe Group as well as Büchi (University of Bradford, 2011). Are their theories

¹⁵ In 2010, the foundation changed its name the Mitrinović Foundation.

¹⁶ There is a large section of Anthroposophy in Mitrinović Collection.

ignored even now?

At the time of turbulent social conditions in Europe, people such as Mitrinović, Büchi, and Soddy who strongly felt the necessity of the alternative social system seriously tackled these problems and advocated the system based on some parts of Steiner's theories. Perhaps, if these theories are right and reconsidered, the current of New Age should not be ignored, while it is unacceptable for a majority because it mentions the existence of the spirit or soul that is impossible to be proved. Under the current unstable situations in the world that perhaps looks similar with the situation before the world wars in Europe, if kinds of 'impulse'¹⁷ that people feel something necessary and would like to do what is ethically right will be increased within them, whether they refer to the existence of the spirit or not, the concept of Free Money will spread. Hopefully, many will research, improve, and spread Free Money.

¹⁷ The word 'impulse' here Steiner had often mentioned means the real impulse of socialism. He said, 'The socialists of today have no idea what, of necessity, socialism entails and must entail. [...] The real impulse of socialism consists in the realization of fraternity in the widest sense of the term in the external structure of society.' (Steiner, 1918). In chapter one, the facts that a socialist George Lansbury wrote a preface to the book 'Free Money' and Keynes defined its idea 'anti-Marxist socialism' were introduced. However, the concept of Free Money itself does not belong to the socialism that academia defines. Rather, it belongs to the socialism Steiner defined that relates to the impulse. The concept of Free Money should not be categorized into the academia's socialism.

Bibliography

- Adamovsky, E. (2008) *Autonomous Politics and its Problems: Thinking the Passage from Social to Political: Chapter 28 of REAL UTOPIA: Participatory Society for the 21st Century* edited by Spannos, C. Oakland: AK Press.
- Banks, S. et al. (2010) *So, What Does Transition Town Totnes Actually Do?: The Story So Far...2006-2010*. Totnes: Transition Town Totnes. p26. p39.
At:<http://transitionculture.org/wp-content/uploads/Transition-Town-Totnes-Ashden-report-final4.pdf>
- Barrow, J. D. (1991) *Theories of Everything: The Quest for Ultimate Explanation*. New York: Ballantine Books. pp38-39.
- Barrow, J. D. (1998) *Impossibility: The Limits of Science and the Science of Limits*. Oxford: Oxford University Press. pp142-143.
- Baumgärtner, S. (2004) *Thermodynamics Models*. Modelling in Ecological Economics edited by Proops, J. and Safonov, P. Cheltenham: Edward Elger. p103.
- Bell, G. (2004) *The Permaculture Way : Practical Steps to Create a Self-Sustaining world*. London: Thorsons.
- Birchall, J. (1994) *Co-op: the People's Business*. Manchester: Manchester University Press.
- Boudon, R. (1999) *Local vs General Ideologies: A Normal Ingredient of Modern Political Life*. Journal of Political Ideologies. Volume4, Issue2. London: Routledge. pp141-161.
- Bowles, P. (2007) *Capitalism*. Short histories of big ideas series. New Jersey: Person Education. p27.
- Butchart, M. et al. (1936) *To-morrow's Money : By Seven of To-Day's Leading Monetary Heretics*. London: Stanley Nott. p14.
- Büchi, J. H. (1933) *Free Money : A Way Out of the Money Maze*. London: Search Publishing Company. p7, pp196-197.
- Chesters, G. and Welsh, I. (2010) *Social Movements: The Key Concepts*. Oxon: Routledge.
- Chun, K. (2006) *The Situation of Korea Community Currency and the Activities of Hanbat LETS*. Fukuoka: Online Laboratory Complementary Currencies Japan. p5. p8.
- Citibank Launches a Local Currency Debit Card in China*. August 8, 2008. Economic

- Journal: More About Virtual Economy. Boston: Economic Journal.
 At:http://ecommerce-journal.com/news/citibank_launches_a_local_currency_debit_card_in_china
- Collom, E. (2003) *Community Currency in the United States*. Maine: University of Southern Maine.
- Councils Facing 9.9% Core Funding Cut*. 13, Dec, 2010. London: BBC.
 At: <http://www.bbc.co.uk/news/uk-11980367>
- Cuts Hit 'Vital' Services at Leeds City Council*. 16, June, 2010. London: BBC.
 At: <http://www.bbc.co.uk/news/10318246>
- Dantas, I (2005) *An X-Ray of Participation in the 2005 Forum: Elements for Debate*. Rio de Janeiro: Brazilian Institute of Social Economic Analyses. p9.
- DeMeulenaere, S. (2000) *A Pictorial History of Community Currency Systems* Complementary Currency Resource Center.
 At:http://www.complementarycurrency.org/materials.php?languageCode=en_EN
- DeMeulenaere, S. (2000) *Principles of Complementary Currency Systems*. Complementary Currency Resource Center.
 At:http://www.complementarycurrency.org/materials.php?languageCode=en_EN
- Desner, S. (2002) *The Principles of Sustainability*. London: Earthscan Publications Ltd.
- Dimitrije Mitrović and New Atlantis Foundation Library and Archive*. (2011) Bradford: University of Bradford.
 At: <http://www.bradford.ac.uk/library/special/mitroviic.php>
- Dobson, A. (2003) *Citizenship and the Environment*. Oxford: Oxford University Press.
- Douthwaite, R. *The Ecology of Money* Complementary Currency Resource Center.
 At:http://www.complementarycurrency.org/materials.php?languageCode=en_EN
- El-Gamal, M. A. (2006) *Islamic Finance: Law, Economics, and Practice*. New York ; Cambridge : Cambridge University Press, 2006.
- Fairewinds Homepage* (2011) At: <http://ifyoulovethisplanet.org/?p=4603>
- Fan, et al. (2009) *Innovation for Development and the Role of Government: A Perspective from the East Asia and Pacific Region*. Washington: World Bank. px.
- Fuchs, D. and Klingmann, H. (1995) *Citizens and the State: A Changing Relationship?* Oxford: Oxford University Press.

- Fukuoka, M. (1978) *The One-Straw Revolution: An Introduction to Natural Farming*.
Translated by Pearce, J. et al. Tokyo: Rodale Press Inc.
- Gelleri, C. (2009) *Chiemgauer Regiomoney: Theory and Practice of a Local Currency*.
Vol.13, pp61-75. International Journal of Community Currency Research.
Norwich: University of East Anglia. p62. p68.
- Georgescu-Roegen, N. (1970) *The entropy law and the economic problem*. In:
Georgescu-Roegen, N. (Ed.), *Energy and Economic Myths: Institutional and
Analytical Economic Essays*. New York: Pergamon. pp53–60.
- Gesell, S. (1862-1930) (1911) *The Natural Economic Order*. Translated by Pye, P.
German: Geokey. At: <http://www.geokey.de/literatur/doc/neo.pdf> p10. p58.
p123. p138.
- Greco, T.H., Jr. (2001) *New Money for Healthy Communities*. Complementary
Currency Resource Center.
At:http://www.complementarycurrency.org/materials.php?languageCode=en_EN
- Greece Crisis: What Now for the Euro Project?* 23, June, 2011. London: BBC. At:
<http://www.bbc.co.uk/news/business-13872847>
- Grahampage, D. (2001) *Dimitije Mitrinovic: Chameleon, Good European, and Exiled
Yugoslavist*. British Columbia: The University of British Columbia.
- Harvey, D. (2000) *Spaces of Hope*. Edinburgh: Edinburgh University Press.
- Heinberg, R. (2010) *The End of Growth*. Post Carbon Insitute, Nov 12. California:
Energy Bulletin.
At: <http://www.energybulletin.net/stories/2010-11-12/end-growth>
- Hirota, M. Y. (2010) *Complementary Currencies Power Point Presentation*. Fukuoka:
Online Laboratory Complementary Currencies Japan.
- Hirota, M. Y. (2006) *Complementary Currency System and Related Systems in Europe:
Taking into Account Their Application in Japan* [Only in Japanese]
Complementary Currency Resource Center. pp1-3. pp5-6.
At:http://www.complementarycurrency.org/materials.php?languageCode=en_EN
- Holloway, J. (2002) *Change the World Without Taking Power*. London: Pluto Press.
- Holman, B. (1990) *Good old George: The life of George Lansbury*. Oxford: Lion
Publishing plc.
- Hopkins, R. (2008) *The Transition Handbook: From Oil Dependency to Local
Resilience*. Devon: Green Books. pp197.

- Hopkins, R. (2009) *The Transition Timeline: For a Local, Resilient Future*. Devon: Green Books.
- House Joint Resolution No. 557: Offered January 12, 2011*. Virginia: Virginia Government. At: <http://lis.virginia.gov/cgi-bin/legp604.exe?111+ful+HJ557>
- Hwa, N.K. and Ng, J. (2002) *From rocket scientists to financial engineers*. Engineering Science and Education Journal Volume 11, Issue 1, Feb. IEE.org. p25.
At: <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=990587>
- Idanius, J. (2000) *Understanding Advantages of a Complementary: Local Currency Exchange*. Complementary Currency Resource Center.
At: http://www.complementarycurrency.org/materials.php?languageCode=en_EN
- If You Love This Planet Homepage* (2011) At: <http://ifyoulovethisplanet.org>
- IMF Says Unemployment in Developed World to Remain 9 Percent through 2011*. (2010) 15, April. Beijing: Global Times.
At: <http://business.globaltimes.cn/world/2010-04/522403.html>
- Ithaca HOURS Online Homepage* (2011) New York. At: <http://www.ithacahours.com/>
- Jayaraman, R. and Oak, M. (2001) *Local Currency as A Development Strategy*. New York: Cornell University.
At: http://www.complementarycurrency.org/ccLibrary/materials/hours_currency_as_development_strategy.pdf
- Jones, S. D. (2011) *Money and Participatory Governance: A Review of the Literature*. International Journal of Community Currency Research, Vol.15, Section A, pp56-68. East Anglia: University of East Anglia.
- Kåberger, T. and Månsson, B. (2001) *Entropy and Economic Processes — Physics Perspectives*. Ecological Economics 36. Missouri: Elsevier. p165.
- Kant, I. (1724-1804) (1784) *Perpetual Peace and Other Essays: Translated by Humphrey, T*. Indianapolis: Hacket Publishing Company, Inc. 1983. p109.
- Kennedy, M. (2004) *A Changing Money System: The Economy of Ecology*. Complementary Currency Resource Center.
At: http://www.complementarycurrency.org/materials.php?languageCode=en_EN
- Keynes, J. M. (1883-1946) (1919) *The economic consequences of the peace* London: Macmillan. p278.
- Keynes, J. M. (1883-1946) (1936) *The general theory of employment, interest and money*. London: Macmillan. p234. pp353-358. p379.

- Keynes, J. M. (1883-1946) (1942) *Proposals for an International Clearing Union*. The Collected Writings of John Maynard Keynes, Vol. 25, Activities 1940-1944, ed. Donald E. Moggridge. London: Macmillan, 1980. pp168-95.
- King, F. H., D. Sc. (1911) *Farmers of Forty Centuries: Permanent Agriculture in China, Korea, Japan*. Utah: Project Gutenberg.
At: <http://www.gutenberg.org/ebooks/5350>
- Lanchester, J. (2010) *Whoops!: Why Everyone Owes Everyone and No One Can Pay*. London: Penguin. p58. pp60-65.
- Lansbury, G. (1859-1940) (1972) *My pilgrimage for peace, and Peace through economic cooperation*. New York : Garland Pub
- Lillington, I. (2007) *The Holistic life : Sustainability through Permaculture*. Stepney, South Australia: Axiom Australia. p24.
- Lindley, R. (1986) *Autonomy*. London: Macmillian Education Ltd.
- Liu, S. (2010) *Time Bank: Services that You Can Get without Money in the USA*. 20th July [Only in Japanese] Tokyo: Epoch Times Japan.
At: <http://www.epochtimes.jp/jp/2010/07/html/d28486.html>
- Lynam, J. (2011) *Greece Crisis: Commissioners 'Fear Future of Eurozone'*. 15th, June. London: BBC. At: <http://www.bbc.co.uk/news/business-13781390>
- Malthus (1766-1834) (1798) *An Essay on the Principle of Population*. London: J. Jonson.
- Matthew 19:16-30.
- McMahon, G. and Mrozek, J. (1997) *Economics, Entropy and Sustainability*. Hydrological Science-Journal-des Sciences Hydrologiques, 42(4) August p504, pp-501-512. Massachusetts: Hydrological Science Journal.
At: http://iahs.info/hsj/420/hysj_42_04_0501.pdf
- Meadows, D. et al. (2004) *A Synopsis: Limits to Growth: The 30 – Year Update*. UK: Earthscan.
- Mekong Watch Homepage* (2011) Tokyo. At: <http://www.mekongwatch.org/index.html>
- Mitrinović Foundation Homepage* (2011) UK.
At: <http://www.mitrinovic-foundation.org.uk/>
- Mollison, B. (2009) *Permaculture: A Designers' Manual*. Tasmania: Tagari publications
- Morrow, R. (2006) *Earth User's Guide to Permaculture*. 2nd ed. London: Permanent Publications.
- Neamtan, N. (2002) *The Social and Solidarity Economy: Towards an 'Alternative'*

- Globalisation*. Vancouver: Langara College.
- Nelson, A. (2007) *Steering Sustainability in an Urbanizing World: Policy, Practice and Performance*. Aldershot: Ashgate publishing, Ltd. p52.
- O'Hara, P. A. (1999) *Encyclopedia of Political Economy: L - Z*. Oxford: Routledge. p779.
- Online Laboratory on Complementary Currencies JAPAN Homepage* (2008) Fukuoka.
At: <http://www.olccjp.net/en/index.html>
- Our Common Future* (1987) Geneva: The World Commission on Environment and Development.
- Permaculture Institute Homepage* (2011) New Mexico.
At: <http://www.permaculture.org/nm/index.php/site/index/>
- Prendergast, C. (2001) *Monetizing Social Exchange*. Chicago: University of Chicago.
- Quake 'Hurt Reactors before Tsunami'* (2011) 16th May. Tokyo: The Japan Times.
At: <http://search.japantimes.co.jp/cgi-bin/nn20110516a3.html>
- Rainsford, S. (2011) *Spain Town Reintroduces Peseta to Boost Economy*. 5th May.
London: BBC.
At: <http://www.bbc.co.uk/news/world-europe-12657225>
- Rogers, J. (2009) *Currency is Destiny: New Currencies for New Times*. Complementary Currency Resource Center.
At: http://www.complementarycurrency.org/materials.php?languageCode=en_EN
- Rösl, G. (2006) *Regional Currencies in Germany - Local Competition for the Euro?*
Frankfurt: Deutsche Bundesbank.
- Rucker, R. (1995) *Infinity and the Mind: The Science and Philosophy of the Infinite*.
New Jersey: Princeton University.
- Seyfang, G. (2006) *Ecological Citizenship and Sustainable Consumption: Examining Local Organic Food Networks*. Vol.22, issue4, October Journal of Rural Studies.
Missouri: Elsevier Ltd.
- Schneewind, J. B. (1998) *The Invention of Autonomy: A History of Modern Moral Philosophy*. Cambridge: Cambridge University Press.
- Seniawski, B. L.(2001) *Riba Today: Social Equity, the Economy, and Doing Business Under Islamic Law*. Columbia Journal of Transnational Law39
Colum. pp701-728. Columbia: Columbia Journal of Transnational Law.
At: http://heinonline.org/HOL/Page?handle=hein.journals/cjtl39&div=26&g_sent=1&collection=journals

- Schmacher, E.F. (1968) *Buddhist Economics* Complementary Currency Resource Center.
 At:http://www.complementarycurrency.org/materials.php?languageCode=en_EN
- Shigeta, M. (2005) *Future of Local Currencies: Case Study of Swiss 'WIR'*. [Only in Japanese] Research and information, No. 484, 16th, Jun. Tokyo: National Diet Library. p6.
- Soddy, F. (1877-1956) (1934) *The Rôle of Money: What It Should Be, Contrasted with What It Has Become*. London: George Routledge and Sons, Ltd.
- Solecopedia Homepage* (2010)
 At:http://en.solecopedia.org/index.php?title=Main_Page
- Star, A. and Adams, J. (2003) *Anti-globalization: The Global Fight for Local Autonomy*. New Political Science. Vol. 25, No. 1. Oxfordshire: Carfax Publishing.
- Steiner, R. (1861-1925) (1918) *From Symptom to Reality in Modern History: Lecture IX: GA 0185*. Virginia: The Anthroposophic Press.
 At: <http://wn.rsarchive.org/Lectures/Dates/19181103p01.html>
- Steiner, R. (1861-1925) (1919a) *Basic Issues of the Social Questions: GA23*. Virginia: The Anthroposophic Press.
 At:http://wn.rsarchive.org/Books/GA023/English/SCR2001/GA023_index.html
- Steiner, R. (1861-1925) (1919b) *The Renewal of the Social Organism: GA24*. Virginia: The Anthroposophic Press.
 At: http://wn.rsarchive.org/Books/GA024/English/AP1985/GA024_c04.html
- Steiner, R. (1861-1925) (1922) *World Economy: The Formation of a Science of World-Economics: GA340*. Virginia: The Anthroposophic Press.
 At: http://wn.rsarchive.org/Lectures/WorldEcon/WldEco_index.html
- Stiglitz, E. J. (2006) *Making Globalization Work*. London: Penguin. pp260-265.
The chairperson Kawamura of Hitachi corp.: We must sell nuclear technology overseas although the Prime Minister Kan disagrees. [Only in Japanese] 22th, July, 2011. Tokyo: Bloomberg (Bloomberg.co.jp).
 At:<http://www.bloomberg.co.jp/apps/news?pid=90920012&sid=aW6IplV5RbFw>
- The Islamic View of LETS and Community Currencies* (1996) London: Islamic Party of Britain
- The Qur'an* 2:275.

- The World Bank Homepage* (2010) Washington: the World Bank.
At: <http://data.worldbank.org/topic/social-development>
- Three Complementary Currency Projects Begin at Full Scale in Ecuador: January 5th 2011*. California: The Pachama Alliance.
At: <http://www.pachamama.org/news/fundacion-pachamama/2011/01/05/currency-projects-begin-ecuador/>
- Time Bank Homepage* (2011) London. At: <http://timebank.org.uk/>
- Towards Social Wholeness Homepage* (2011) Manila. At: <http://societalwholeness.org/>
- Transition Culture Homepage* (2011) UK. At: <http://transitionculture.org/>
- Transition Network Homepage* (2011) Totnes. At: <http://www.transitionnetwork.org>
- Transition Town Totnes Homepage* (2011) Totnes.
At: <http://www.transitiontowntotnes.org/>
- Williams, C. G. et al. (2001) *Bridges into Work? An Evaluation of Local Exchange and Trading Schemes (LETS)*. Policy Studies, Vol. 22, No. 2 Oxfordshire: Carfax Publishing Company.
- Wise, L. (1940) *Silvio Gesell : An Introduction to Gesellian Economics*. Great money reformers. No.1. London: Holborn Publishing and Distg. company. p4. pp9-10.
- WIR Bank Homepage* (2011) Basel.
At: http://www.wir.ch/index.cfm?DC86BF333C1811D6B9950001020761E5&_lang_id=1
- Wolf, R. (2000) *The Regionalist Answer*. Minnesota Journal of Global Trade 9 Minn pp610-622. Minnesota: Minnesota Journal of Global Trade.
At: http://heinonline.org/HOL/Page?handle=hein.journals/mjgt9&div=27&g_sent=1&collection=journals
- Worchel, S. et al. (1998) *Social Identity: International Perspectives*. London: SAGE Publications.
- Zencey, E. (2009) *Mr. Soddy's Ecological Economy*. 11th April, 2009. New York: The New York Times.
At: http://www.nytimes.com/2009/04/12/opinion/12zencey.html?pagewanted=1&_r=1&ref=opinion

Appendix

Q&A about Chiemgauer (answered by Christian Gelleri, Director of Chiemgauer. 16th May 2011)

Q1. Is it compulsory that a shopkeeper sells a product paid by Chiemgauer at the same price paid by Euro? Or is it the matter on his discretion? Does the shopkeeper can decide the different prices on the same product by Chiemgauer and Euro respectively? In this case, do Chiemgauer's prices include direct taxes on sticker prices?

A1. Yes, he can. Some shopkeepers give a discount when you pay with Chiemgauer. One shopkeeper didn't want to grant a 'regular' discount because a customer wanted to buy with Chiemgauer. Both phenomenons are relatively rare. Most shopkeepers have exact the same price. Taxes are the same as in Euro because 1 Chiemgauer = 1 Euro.

Q2. Will you fix the exchange rate between Chiemgauer and Euro all the time?

A2. No, it always depends on the members of our associative. They can decide the value of the Chiemgauer.

Q3. When the polar currency Euro will decrease its value dramatically for an economic crash, will you consider changing the rate?

A3. Yes, of course.

Q4. In Japan, there were many projects of community currencies (which did not have demurrage), and almost the projects failed because those currencies were not run through consumer goods as a certain economist criticized. Does Chiemgauer-type currency need to focus on circulation through consumer goods in the beginning?

A4. To begin with consumers and to integrate demurrage are two of our basic principles.

Q5. Do you think that community currencies of the non-demurrage type will work permanently? Will you recommend the Chiemgauer-type currency to others?

A5. Small communities don't need a demurrage because you can talk with everybody but when you grow the system will be more and more anonymous and you need a common rule, which guarantees the stable velocity of money. You can also work with interest, inflation and denomination of currency that also works for a certain time with all the problems you have with it.

Q6. Is it necessary that all currencies, which have a function of saving, are abolished totally? Do you have the intention to do so? What do you think about the future of the present currencies?

A6. You can buy shares of cooperatives, solar-panels and many more real investments. You can always save Chiemgauer in real investments. Saving is very important for economy but savings can harm if they are not used for real economy.

Q7. In the future, is it possible that the Chiemgauer-type currencies can work in big cities? Are strong leadership and consensus necessary in order to promote?

A7. Yes, you need a lot of power to establish complementary currencies in big cities. We will start at Munich with small experiments this year.

Q8. Are you aiming the realization of the Social Threefolding? It will be a very long way to achieve it as its concept is still minor; as long as I know, Only do Philippine activists Nicanor Parlas organize the activism for the Social Threefolding. If Chiemgauer project will become bigger, do you have an intention to integrate the Social Threefolding with the your project?

A8. Yes, the threefolding principles are always important and present in our work. Working with consumers, businesses and non-profits is the local level for threefolding. The individuals represent the aspect of freedom, businesses the aspect of solidarity and non-profits the aspect of democracy and communication. The Chiemgauer has the aspects of exchange, saving und donating:

1. Medium of exchange: cash and electronic

2. Saving: Real investments as cooperative shares and financing as microcredits up to 20.000 Chiemgauer without interest.
3. Donating: 3% of currency exchange for non-profits

Q9. Except Anthroposophy, I do not know social movements that try to refer spiritual things precisely. Transition Town projects in the UK, Permaculture, and other activism are based on natural science. What do you think the future of these social movements in the age of materialism that Steiner warned?

A9. I know some Anthroposophers who work in this movements and that's good. Some Demeter-people are very good with combining it with Permaculture. Some of our activists are catholic or protestant and doesn't read anything by Steiner but they work very good and hard and when you look the big picture of the initiative you can find all the principles. Some of the activists are 'Steiner fans' and their impulses find high respect. This only works if the impulse is 'pure' and this doesn't work if the 'anthroposophist' have many shadows with him.