

# SPACE JAPAN BOOK REVIEW

From a satcom researcher point of view

Reviewer: Takashi Iida, Editorial Advisor

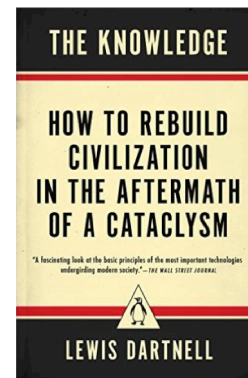
**Lewis Dartnell: "The Knowledge: How to Rebuild Our World From Scratch", Janklow & Nesbit (UK), Ltd., 2014.**

Although this book has somewhat exciting title, the reviewer is interested from the following two reasons. First, the number of people is set to 10,000 for the world civilization to be able to be reproduced when it disappeared. Actually the reviewer considered to be necessary to communicate with the Earth's Internet network when the size of the colony on Mars would become 10,000 people, and the Mars-Earth high-speed communication system was designed [1]. This book seems to give any rationale for the figure of 10,000. Second, since the author of this book concerns the space related research, some topics related space systems are included as described below. This book will be introduced including the reviewer's personal opinion. This review is based on Japanese translation version of this book.

The author, Lewis Dartnell (titles abbreviated, hereinafter the same) was born in 1980 and was awarded a first class Bachelor of Science degree from the University of Oxford. He completed his Doctor of Philosophy in Astrobiology at University College London. His thesis was "Computer modeling and experimental work on the astrobiological implications of the Martian subsurface ionising radiation environment" [2]. He is now a UK Space Agency research fellow at the University of Leicester, where his research focuses on the study of extremophile microbes and their signs of past or present life. He is a writer for popular science and has won numerous awards in science writing. He contributes to magazines such as the Gardian, The Times and New Science. He appears on television including BBC-TV and Sky News.

This book calls the world scratch as a large catastrophe. The large catastrophe that this book assumes is as follows: The worst way led to the large catastrophe is due to all-out nuclear war. The bad situation as much as the worst one is that the large-scale coronal mass ejections occur from the sun, although it is not direct lethal force. In this case, a large electric current would flow through the power line and the transformers would be broken. The global blackout due to the broken power grid would be cause not only to interrupt the supply of water pumping, gas and the purification of fuels, but also that infrastructure would be destroyed and social order would be collapsed. Remaining necessities of life would be consumed rapidly, and a large-scale population decline would be promoted. Other situation is the case that asteroids crash to the Earth and that the state of the atmosphere is fatally altered. Stones and dust would soar up to high sky, fire would be ignited by hot air, the whole earth would be covered by the wind exhausted and smoke from spread fire. As in the case of the nuclear winter, global temperature would fall rapidly, and the world scale of a large famine would happen to become of the poor harvest. Another situation is considered to be pandemic spread worldwide quickly of the highly toxic virus whose incubation period is long and fatality rate is close to 100 percent infection. Because most of the world's population is came to live in the city since 2008, it would provide a situation in which such infection is rapidly expanding in urban areas.

When industrial civilization and social order are collapsed, survivors began a fierce battle on lacking resources. There is a possibility to become a savage world where looting and eradication against weak people are done. This book seems to regard this state as the movie "Mad Max." [3]. When the population decreases more, the state eventually becomes like the movie "I Am Legend" [4]. Only a person survives, though infrastructure exists to some extent. I think that the world that the former slaughter is carried out is the world drawn in the novel "Far North" [5]. However, the assumed scenario in this book is to happen extreme population decline rapidly and is the case that physical infrastructure of technological civilization is left in a state of pristine. This book has called as the "The best way to end of the world". Even so, when persons disappeared, for example, the orbital altitude of the International Space Station is decreased in 2 km per month and it will ruin eventually. GPS also will become completely useless in a few years. In addition, power and other communication infrastructure also can not be maintained if there are no more manpower.



<http://www.amazon.com>

Then, if how many people survived at least from the global catastrophe, not only the people could dwell again in the world, but also reconstruction of civilization could be boosted. In conjunction of analysis of mitochondrial DNA sequences of the Maori in New Zealand, a study of estimating the number of ancestors who first come to Eastern Polynesia aboard the raft has been performed. Only about 70 people of childbearing women can form the ancestors having a genetic diversity, and therefore it has been revealed that the total population is a little over two times. From the same gene analysis, the majority of Native Americans are estimated to be the same number of founder population. However, it takes hundreds of years to revive a so-called civilization by such a small number of people. Many working forces are needed to ensure the agricultural productivity. In addition, a large number of people who can freely develop other craft industries and revive the technology must be ensured sufficiently. In order to establish the best restart, survivors who have skills of wide range field must be existed sufficiently. Knowledge of as a group is necessary for prevention from excessive retreat. Therefore, this book promotes discussion by setting an ideal starting point of this thought experiment as follow: About 10,000 people survived in various place gather to make the new community and the situation that can work together in partnership.

Most of current papers of sophisticated science and technology are difficult for amateurs to read and understand, even to rebuild the civilization. But in the situation that can not live if nothing to do, what to do is the subject of this book. One of the measures is to prepare books immediately useful in advance. This book seems to aim such a purpose. There are many items to be challenged. They relate extensive range including agriculture, transport, communication and medical care. For example, how to make soap is described in hygiene. It is described how to use the ash by burning woods. Because there is no fuel for the transport means, gasification car which was used during the war is described. Concerning communications, even if the world communication infrastructure is destroyed, communication between locals is necessary for the work. So it describes utilization of Morse code, how to make a crystal radio, and how to make a tune circuit including a principle for improving efficiency of a spark transmitter. In addition, a Pelton wheel [6] is introduced for purpose of electric power generation and others. The Pelton wheel was invented by Lester A. Pelton in 1870s. He is a ancestor of Dr. Joseph N. Pelton [7] who is familiar in our JFSC (Japan Forum on Satellite Communications) that issues this magazine, Space Japan Review, as its bulletin.

The work above would be necessary when the commodity can not be obtained due to a war, for example. In this conjunction, some episodes are described. When it was feared that the United Kingdom might lose the war at the time of the First World War due to shortage of materials for packed in shell casings, that is cordite which is made from acetone, a way was found to use a special bacteria that secrete acetone, and schoolchildren was diligently collected the conker in order to grow the bacteria. In addition, with respect to the rubber trees to generate a component of automobile tire, because Japan occupied Southeast Asia, the Allied Powers lost 90% of the source of rubber. Then the wood alternative was promoted to be used.

This book has described items that are carried out in, so to speak, the DIY field from a little more advanced in principle point of view. However, it would be important for an amateur to try to make as written. Then it might be good to understand the rationale for improving the performance in the next stage. In addition, when burning woods and moving gasification cars, environmental pollution is caused, but it has not been addressed in this book. It might be good to ignore because the population is small. In any event, this book has described many interesting things for the people who live in the city. Because it may be helpful even in any chance of disaster, it might be interesting to read it. Nikkei Shimbun Book Review [8] would be also helpful.

#### References

- [1] T.Iida, Y.Arimoto and Y.Suzuki: "Earth-Mars Communication System for Future Mars Human Community: A Story of High Speed Needs Beyond Explorations", IEEE AES Magazine, Vol.26, No.2, pp.19-25, Feb., 2011.
- [2] [https://en.wikipedia.org/wiki/Lewis\\_Dartnell](https://en.wikipedia.org/wiki/Lewis_Dartnell)
- [3] [https://en.wikipedia.org/wiki/Mad\\_Max](https://en.wikipedia.org/wiki/Mad_Max)
- [4] [https://en.wikipedia.org/wiki/I\\_Am\\_Legend\\_\(film\)](https://en.wikipedia.org/wiki/I_Am_Legend_(film))
- [5] Marcel Theroux: "Far North", Farrar, Straus and Giroux, 2009.
- [6] [https://en.wikipedia.org/wiki/Pelton\\_wheel](https://en.wikipedia.org/wiki/Pelton_wheel)
- [7] <http://www.clarkefoundation.org/about-us/leadership/dr-joseph-n-pelton-vice-chairman/>
- [8] M.Uchida: "The Knowledge: How to Rebuild Our World From Scratch by Lewis Dartnell, Road map discussion of civilization reconstruction after the catastrophe", Nikkei Shimbun, Aug.23, 2015 (in Japanese).