

Maintenance of Life by Science and Technology

— Creation of Eternal Life Spreaded to Unlimited Universe —

Yoshinori Hayakawa¹

桐蔭横浜大学医用工学部

(2012 年 3 月 31 日 受理)

We all know that we will die inevitably. Multicellular lives, thus, leave space and resources for descendants. We thank to our ancestors beginning from the birth of life. We will return your favor to our descendants.

All lives on earth, however, will be exterminated in future including human kind. If so, what will be the meaning of our life now? I am not scaring you in order to spread a fake religion. Off course, even if it happens, the later the better. Directly or indirectly, nearly every living thing utilizes energy of nuclear fusion in the sun to live.

The aspect of the fusion will change by the course of time and solar light is gradually increased. And lives on the ground will perish within hundred million to one billion years. As stars like sun consume nuclear fusion energy, they have limited life span. Already to protect terrestrial warming by green house effect, a method is proposed, to launch mirrors as satellites, that reflect solar light. The method seems to prolong life of the living things on the ground. However, the sun will become large several billion years later as a

red giant and the earth will be swallowed. The sun will keep to be red giant approximately one billion years, and later will contract and become the white dwarf star, stops nuclear fusion and is aloud to cool down slowly after several ten billion years until it ceases to emit light. Two methods exist to evade this difficult situations. One is to escape solar system and transfer to other star within hundred million years, and another is to stay in solar system in space colonies keeping appropriate distance from the sun while the sun stays to be red giant or white dwarf star and later transfer to another star.

In addition, approximately several billion years from now, the Small Magellanic Cloud and the Large Magellanic Cloud will collide with our galaxy, Milky Way, and a little afterwards will collide with the Andromeda nebula. Large disturbance will happen to our galaxy, although stars will rarely collide with each other as they are not densely situated.

Therefore, we might have to spread to many stars in Milky Way for eternal life. If life is spread to many stars, it will have the higher

¹ Department of Clinical Engineering, Faculty of Biomedical Engineering, Toin University of Yokohama, 1614 Kurogane-cho, Aoba-ku, Yokohama, Japan 225-8503

possibility to survive the large disturbance due to collision of Galaxies. For that purpose we should develop science and technology. One of the basic questions is to transfer to other star in living state or to transfer as preserved genes. It is predicted by general theory of relativity that a space ship travel through Milky Way during period of person's life if it travels at the speed very near to light velocity. The necessary energy required is nearly infinite and space ship will be destroyed by the collision with small object. The nearest star to sun is 4.4 light years apart (Alpha Centauri). We assume 1/10,000 light velocity for space ship, resulting 44,000 years for travel. Before launching heavy space ship with genes that require thick shielding and large spaces for life, we should send light weighted inquiry rockets with higher velocity. It should find out whether the target star has sufficient magnetic field to shield Galaxy cosmic rays, and whether it has small celestial bodies like asteroid or comet that can be used as resources.

It seems to be impossible to supply sufficient energy and materials for people living in space ship for such long time, as the outer space is dark as night on the earth. So it seems rational to carry genes by computer controlled space ship. The space ship should be protected against cosmic rays by shielding materials, because strong magnetic field seems not to be sufficient against Galaxy cosmic rays as they consist of high energy protons and ions of heavier elements. The materials are probably collected asteroids or small celestial bodies in Kuiper belt or Oort's cloud to save fuels for rocket. The shielding materials serves as future resources as well. After reaching the targeted star, genes will be recreated to life and then reproduce and increase in number happily. Josephson

computer seems to be suitable to control the space ship in open space as it can be operated at very low temperature, and the average space temperature is minus 269 degree in centigrade. As energy source radioisotope batteries should be applied while light energy from stars are not available in open space.

Any way we have not yet developed computers or soft wares functioning 44,000 years without serious error. Much more advance of sciences and technologies are required. In order to develop sciences and technologies, improvement of education efficiency is required. The reason is due to the fact that to develop new science and/or technology, scientist should be sufficiently educated. And the required knowledge to develop newest science is increased by the course of time. Especially efficiency of basic education, reading, writing, calculating, and understanding international language, should be increased as far as possible. For that purpose, Universal Literacy Alphabet, Computer Numerals, New Abacus Numerals, International Numeration System, and Esperanto [an improved language from Latin] seem to play important roles. Automatic revival of genes to life also seems to be a big challenge. For mammalian, artificial uterus should be developed together with developing robots for substituting mother. Artificial uterus is under development to overcome the ethical problem of surrogacy. Automated teaching machine should also be developed. Plants should also be transferred, as animals cannot live without eating plants. We should have to know set of genes of species transferred together with human genes. Genes of bacteria in animal intestine and skin, of course, should be included for healthy life. They should make closed set of creature group that last eternally. Cultivation

plants and domestic animals are, of course, to be included.

Edible insects such as crickets seem to be suitable to grow in small space in space colonies yielding little discharge. Guinea pigs also seem to be suitable to be transferred due to the fact that they were fed in the house of present and old South America as source of meat. Some kind of intestinal bacteria of New Guinea highlander create, from ammonia, essential amino acid for human kind. They seem to be worth while to be transferred. We also have to find ways to automatically recreate them from genes.

Bacteria may be kept unchanged for a long time and recreated to living state simply by freezing. Bacteria in the ground seem to play important role for growing crops as well. The detail is not elucidated yet. They may be transferred and recreated from genes as well. The crops suitable for soilless growth should also be transferred for space colonies. Concerning virus it is questionable to transfer, but it may be impossible to exclude them from transfer.

Anyway, large amount of biological researches is necessary for the project. These researches can be developed on the earth independently from physical researches on rockets, long life computers, computer software, universe researching and so on.

Also in space colonies that rotate around star, silicon computers should be used utilizing light energy of star. Space colonies seems to be the best solution because it does not necessitate suitable planet. Even if there are suitable planets with water, they seem to be rather dangerous to live on. As there may be dangerous bacteria against which our immune system does not respond. So even if the space ship reaches near planet with water, revival of genes to life should be done

in space colony. Transfer to the planet will be done after checking of existence or not of dangerous pathogens by sending live mice and later sending inquiry persons wearing protect suits.

Zero discharge technique of resources should be developed for space colony life, where only the star light energy is necessary. That system can be researched and developed in orbit around earth. If such system is developed, it can be used to evade stronger sunlight in future in space colonies. Even perfect zero discharge technique of resources may be impossible, they can use small resources from asteroids.

Even a part of the proposed research is useful for near future purposes.

The history of earth revealed that mass extinction has happened many times.

The dinosaur exterminated by the impact of a big meteorite. Collision of the comet to earth may happen as well. There is another possibility of mass extinction by intensification of eruption activity like largest mass extinction at the end of Permian of approximately 250 million years ago. Today, through environment deterioration of 1 - 2 years, many people can survive eating kept grain, canned or bottled foods, retorts, instant noodles, and dried fishes and meats. But the deterioration period may be much longer. The orbit of impacting meteorite may be changed by rockets in future. But even if it fails, many genes and living humans of several hundreds in the space colony around earth or at Lagrange point of earth can rebuild the green earth, unaffected by the tragedy. For meteorite impact, underground base or moon base seems to be available as well. The method is also available for intensification of eruption activity, if the period of staying space colony is made long enough by development

of zero discharge technique of resources. Moon base seems to be available in this case as well.

In another case, many scholars of genetics warn that development of medicine will endanger human being. As medical science and technology develop, even sickly people are saved and they will have babies. From personal point of view, I want to share their happiness. But in long term, it will endanger whole future human being. If we have established long term preservation of genes and revive them to life not automatically but manually, we can save human being. First we keep genes of present healthy persons and second after ten thousand years later, when human being is suffering, genes are revived to persons and by usual marriage they can decrease the number of genetic defects of people to approximately half. It is said, that when Buddha was born, he said "I am the only one admirable in the heaven and on the ground". It is too awful to say so. But it is very nice to say "I am the life. I am the resurrection. I came to save people from extinction". But do not say in addition "I am God". It is too awful to say so.

References

- Yoshinori Hayakawa,
Computer Numerals for Eradicating Poverty and Educating Geniuses. 307-319. Proceedings of the 47th Korean Nat'l Meeting of Mathematics Education Kyungsung University, Nam-gu, Busan, Korea November 4-5, 2011(Fri.-Sat.)
<http://www.cc.toin.ac.jp/tech/bmed/ft28/AbacNumEn.html>
- Yoshinori Hayakawa,
New Abacus Numerals for Eradicating Poverty and Educating Geniuses. 321-328. Proceedings of the 47th Korean Nat'l Meeting of Mathematics Education Kyungsung University, Nam-gu, Busan, Korea November 4-5, 2011(Fri.-Sat.)
- Yoshinori Hayakawa,
Universal Literacy Alphabet(ULA) for Foreign Language Learning, and against Poverty, and Spread of AIDS(HIV), of Tuberculosis, of Malaria, and against Population Crisis
<http://www.cc.toin.ac.jp/tech/bmed/ft28/UnivAlphEn.html>