Hybridizing Medicines

Tiger Penis Project

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Abstract

There are some alternative medicines in different cultures, and their effects sometimes cannot be proved by contemporary scientific researches. They are usually even regarded as cultural myths, such as tiger penis for virility in traditional Chinese medicine (TCM). And the huge demand of wild animal parts as TCM results in increasing endangered animals. However, TCM still could contain a certain value which differ from mainstream western medicine. Therefore, the main research question of this thesis is how can we find the answers for the conflict between the value of traditional Chinese medical culture and the contemporary thinkings of environmental conservation?

Using non-western perspectives of speculative design, this thesis proposes new forms of creating artificial animal part by emerging biotechnologies for Chinese medication in the future which will help to avoid putting in danger more animals. By combining Western and Chinese medicine both together, the methodology of this hybrid medicine provides more possibilities for the human society and natural environment. Finally, this design approach could be applied to other traditions around the world that could also be having conflicts between modernity and traditionality.

Fig. 1 The Cove (2009) (online image) www.tropicultura.com/en/the-cove-nos-hacemos-vegetarianos/. <March 29, 2018>

Introduction

In 2015, after his first documentary *The Cove*, director Louie Psihoyos collaborated with Oceanic Preservation Society to produce his latest documentary *Racing Extinction*. This documentary is mainly about the prediction by scientists that at the end of 21st century half of the species on the planet will vanish, and the film further points out that we have come to the moment of the 6th mass extinction. With "dinosaurs" playing the leading characters in the previous mass extinction, "humans" are the critical factor leading to the 6th mass extinction. Louie profoundly captured how the local fishermen from Taiji, Higashimuro District, Wakayama Prefecture, Japan, herded dolphins for hunting.[Fig. 1] The film raised the awareness of our own kind's brutality

Fig. 2 Racing Extinction (2015) (online image) www.youtube.com/watch?v=MwxyrLUdcss. <March 29, 2018>

Fig. 3 Racing Extinction (2015) (online image) www.youtube.com/watch?v=PijSIbXCK1Q. <March 29, 2018>

in destroying natural environments and won him the best documentary feature at the 82nd Annual Academy Awards. The 2015 *Racing Extinction* also features animal protection issue. Viewing from film content, it delves into the causes of species extinction from the perspective of social realism. After theoretical analysis and field research, two leading causes were concluded: firstly, humans' acts of killing; secondly, global climate change. To be clear, the culprit for the latter remains to be mankind. Hence, we can conclude that the direct and indirect impacts made by human beings have lead a series of species extinction around the globe.

In *Racing Extinction*, a more vivid way of filming is employed to expose the cruel reality. The cameramen implicitly play the role of reporters, guiding viewers into the marketplace for endangered animals in China, where the organs of animals are on open display.Fig. 2 Fig. 3 The filmmakers attempt to use these images to showcase human cruelty and how far we can go for gluttony. Most of the viewers from around the world have been shocked by these frames of gruesome fact. However, as a person from Chinese culture, the impression received while watching this documentary is different. To me, some of the visual images in the scenes are not necessarily

cruel, for it is a commonplace in my homeland Taiwan that some stores sell animal organs as Chinese medicine ingredients. As a result, a slew of weird feelings rose from the bottom of my heart. On the one hand, the idea of protecting other species brought up by the director is associable; on the other hand, I question if the director has used a way of filming that is simply too provocative and therefore it demonizes part of the culture of traditional Chinese medicine (TCM).

In fact, back to the time when *The Cove* first draw immense attention, it had already drawn similar questions. Brendan O'Neill, the reporter of British magazine *Spiked*, then brought up the racial issue that was seldom discussed, saying:

> *The Japanese are depicted as suppressed and unquestioning: we're shown speeded-up footage of hordes of Japanese people walking through garishly-lit, buzzing city centres, their travels to work or home crudely reduced to pointless, super-fast marching through the streets, and we're told that there's a saying in Japan that 'if a nail is sticking up, pound it down' – in other words, Japanese culture is stultifyingly automaton. Where old racist America depicted the Japanese as rats, contemporary countercultural America depicts them as members of a rat race. The Taiji fishermen – sorry, the hook-wielding crazy killers of beautiful dolphins – come off the worst. The film dehumanises them to an alarming degree.*[1]

1 Brendan, O'Neill. "American hippies vs the evil Japanese.", *Spiked Magazine*. November 4, 2009 www.spiked-online.com/newsite/article/7669#.WjttB2T81hA.

O'Neill argued that the director wielded music and images to deliberately shape the image of dolphins as being innocent and endearing, and with the same maneuver, certain music and ways of filming were used to depict the Japanese fishermen as cruel. Hence, a documentary akin to this might not be understood as simply presenting the facts but as an vehicle to target a certain population or culture. That argument, likewise, reflects my question regarding *Racing Extinction*, as it might have been a sharp blade inflicting harm on Chinese traditions.

In his book, French philosopher Bruno Latour examines the concept of "modernity," derived from the advance of science, and the concept of the Great Divide that appears in a wide array of discourses on modernity. The Great Divide denotes the divisions between nature and culture, subject and object, fact and value, as well as "Modern Us" and "Primitive Them," to name a few. The divisions make the modern society accommodates no more than the thinking of black-or-white dualism, under which an argument would be taken as unvalidated if it fails to meet this ideology.[2] According to Latour's view, it seems that we can somehow picture director Psihoyos and his team grounding themselves in the position

2 Bruno, Latour. Translated by Catherine Porter, *We Have Never Been Modern*. Harvard University Press, 1993.

of “modern us,” waving the flag of environmental conservation while examining the cultures that do not fit in this modern view.

However, why on earth we should attempt to preserve traditional culture, and what is its value? “The Convention for the Safeguarding of Intangible Cultural Heritage” was passed by the UNESCO General Conference held in 2003 and went into effect on 20 April 2006, as a mainspring of promoting cultural diversity and a guarantee of sustainable development of human creativity. The candidates of “Intangible Cultural Heritage” were nominated by the states parties to the convention ratified in 2003, before evaluated by the committee under UNESCO and inscribed on the list. In 2009, the “first elements” on the list were inscribed at the session of Committee held in Abu Dhabi. Up to 2014, 364 intangible cultural heritage elements had been on the list. Multiple elements of TCM Culture such as acupuncture, Chinese orthopedic tuina were inscribed in China Intangible Cultural Heritage National list, in which only one element—acupuncture and moxibustion of traditional Chinese medicine—was inscribed in UNESCO list. In other words, there has been an international consensus on the protection of cultures worldwide and a set

of evaluation criteria is being established by UNESCO to assess the value of intangible cultural heritage, while many of the elements of TCM still await to be recognized. Therefore, in the face of the contemporary issue of environmental conservation, how the culture of TCM shall orient itself is a necessary measure. Nonetheless, not only TCM culture but also any other traditional cultures around the world would be faced with the collision against the contemporary concept of environmental protection. When met with this sort of struggle, how exactly should we handle the issue? Moreover, this inquiry is to be the central theme in the research of this thesis.

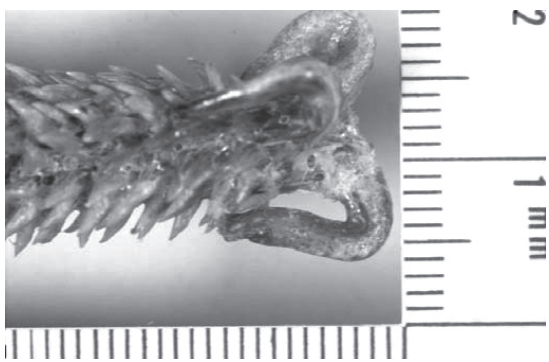
This thesis investigates the subject of the collision between environmental conservation issue and the TCM practice of consuming organs of endangered species in Chinese culture. It starts with the analysis of the subject with STS approach, and the following chapters are designated to deal with the attempt to conceive the solution to the problem in the subject through the practice of “design.” The first chapter mainly cover the struggle between modernity and traditionality in the culture of TCM; through Latour’s theories and critical analysis on modernity, it is revealed that modern Chinese medicine has integrated modern

biotechnology and subsequently grown to be an emerging “hybrid.” Nevertheless, this “mongrel medicine” has, along with the rapid growth of China’s political and economic powers in recent years, instead become one of the means for the Chinese government to promote nationalism; due to this means of promoting nationalism, many other new international issues regarding hygiene and health have unfolded. Based on the introductory knowledge of TCM culture presented in the previous chapter, in chapter 2, the common concept of “environmental conservation,” popularly accepted as is, is analyzed and problematized. In contemporary times, when the planet sees the coming of “anthropocene,” protecting the earth for natural environments and the animals residing within is an well-received concept. However, what is the fundamental reason behind the idea of protecting other species? Chapter 2 begins with examining the concept of animal rights and further extends to various distinct arguments of environmental conservation, ranging from tribalism, preservationist, to human-oriented utilitarianism. Even after concluding different points of views on environmental conservation, it is still not possible to conclude an argument that is to be convincing to everyone, either at a factual level or a philosophical one.

In other words, this issue is a never-ending debate. The chapter closes with fact that we will all have to deal with the environmental issues right before us prior to end of the debate.

Following the previous two chapters, one can understand why the culture of TCM should be preserved and that destroying natural environments that we have as well as killing endangered animals to preserve the culture is not acceptable. Hence, before conceiving a solution, it is necessary to comprehend why those believing in TCM would consume animal organs. Is it because these animal organs have “real” pharmaceutical effects? Is the efficacy proven by scientific experiments? If not, does it allude that this kind of culture is not different than a myth? Nonetheless, how do we define “myth”? Is it necessary to abolish a culture that is deemed a myth? Moreover, is the culture indeed valueless? All these questions are to be answered in chapter 3; by referring to the research on “placebo” used in Western medicine, the analysis is conducted to answer if animal organs serve merely as placebo. Furthermore, the benefits and negative effects of placebo along with the cultural value derived from “myths” are to be examined in this chapter. The result of the analysis suggests that different

Dried tiger penis, whole (upper as x-rayed and middle as photographed), and close-up of tip (lower right), showing the approximate position of the internal penis bone, also known as a baculum. Both scale lines represent approximately 2 cm.



Extravagantly carved tip of a bull's penis for simulating a tiger's penis. This is how cattle genitals are made to be used as replacements for genuine tiger parts.

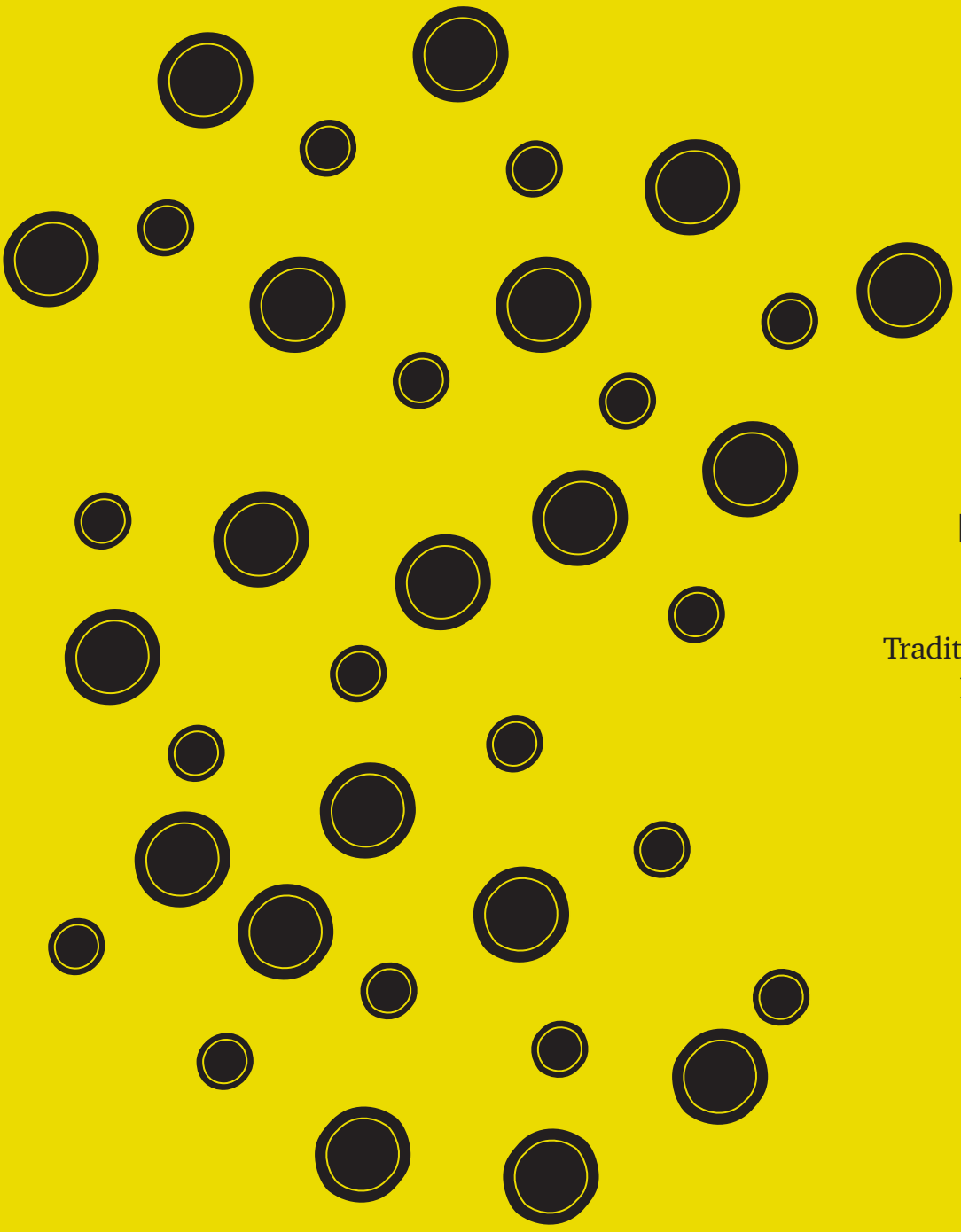
Fig. 4 Bonnie C. Yates, "Distinguishing Real vs Fake Tiger Penises", *Identification Guides for Wildlife Law Enforcement No. 6*, March 2005.

animals organs are of different significance; for instance, rhino horns and bear bile are scientifically proven to contain specific chemical substances of pharmaceutical effects. However, the virility enhancement property of a tiger penis is still not yet proven by science.

With the pilot study of the previous three chapters, in chapter 4 the information and analysis results are put into practice of design. In this design project, "Tiger penis," which is not yet scientifically proven for its efficacy and deemed as a cultural myth, is selected as the research subject.[Fig. 4] This project is aimed to find a solution to the dilemma between preserving the fading culture of TCM and the fact that the tiger is dying out. This chapter is divided into three parts. Firstly, with animal organs that denote myths of virility collected, and the appearance of these animals are deconstructed to deduce the most representative qualities of "virility." By utilizing a series of visual image experiments (including painting, sculpting, and model-making and so on), to reshape a new image of virility. Moreover, this hybrid animal is to possess a more symbolic virile image than the tiger does. Secondly, state-of-the-art technologies (such as synthetic biology, 3D bioprinting, tissue engineering and digital

technology) are wielded to create the prototype of the medicine that is practically designed to replace the use of tiger penis. Some of the technologies, partly due to legal and technical limitations, are still not available to be applied. Hence, in the third part, the methodology of speculative design is employed to construct a fictional future scenario, for which some of the objects and images are realized so that the viewers can imagine the impacts this medicine could have on the future society. Furthermore, the endeavors to collaborate with Art & Science institutions were made to actualize the constructed future scenario into events such as workshop and participatory performance, through which to promote public engagement. The viewers are to experience the entire design project through not merely viewing but also active engagement to explore this future scenario. After the events, the participants' feedback is gathered as the field research data of this project, which are used as the references to improve the original design. Besides, cooperation with reporters is also planned to take advantage of media to cover these events, and the employment of social media is used to collect more of the public's responses, which is expected to be capitalized for a more profound cross-disciplinary study in sociology and design.

In chapter 5, I reposition myself as a researcher to inspect and critique my own design project, and I also appropriate this chapter as a way of conversation with myself. This chapter is divided into three parts to examine and reveal how this design project is conducted to inquire into the grey areas in the researches of interculture, interdiscipline, and interspecies. In the final chapter of "conclusion," I present an argument that this project is more than just an investigation into the struggle between TCM and environmental protection in the issue of "tiger penis," but also the construction of a methodology. Moreover, through this methodology, it is possible for us all to solve all the existing—struggles between traditional cultures and Trends in contemporary thoughts—around the world.



Chapter 1

Mongrel Medicine

The Struggle between
Traditionality of Traditional Chinese
Medicine and Modernity

The establishment and promotion of a medical system depend not merely on scientific knowledge but also the co-construction of political, economic and cultural factors. The development of "traditional Chinese medicine," which is closely related to "Chinese Culture," fits tightly to the concept. The Economist published an article, "Why China's traditional medicine boom is dangerous", Sep. 1, 2017.[3] The article suggests that since 2012, the year Mr. Xi came to power, he has been actively promoting the development of TCM as one of his policy guidelines.
The inclusion of TCM has long been in many of the policy guidelines since the Chinese economic reform; however, Xi was the one who

3 "Why China's traditional medicine boom is dangerous.", *The Economist*, September 1, 2017. www.economist.com/news/china/21727945-unproven-remedies-promoted-state-why-chinas-traditional-medicine-boom-dangerous.

first implemented a stream of plans, policies, and instructions. In recent years, along with the economic rise of China, the government has since aligned concepts of nationalism and patriotism with the development of TCM. Through educational institutes and academic centers widely established across the Western world, the government attempts to forge an impression that TCM is equally advanced as Western medicine in the development of civilization. Meanwhile, Western countries have been gradually incorporating Chinese treatments such as acupuncture and Chinese medication in their medical regulations and health care system, which has imbued the Chinese government with a sense of national pride, seeing TCM gradually reach the equal lawful status as Western medicine does around the world. Nevertheless, the Economist pointed out sharply the accelerated development of a medical system by political force has resulted in some serious social consequences and danger. Firstly, with TCM overly promoted, many patients who choose TCM over Western medicine that offers suitable treatments end up worse off for delaying medical treatments. Secondly, the author criticized the Chinese government for loosening the requirement for a licensed TCM doctor just

to fill doctor shortage. This policy to promote TCM has consequently resulted in compromised health care quality the general public is to receive. Lastly, the author believes that the environmental problems caused by the TCM ingredients, most of which are made from endangered animals or plants, cannot seem to be solved. Even though the Chinese government has attempted to build more farms, it fails to contain the staggeringly rising number of illegal logging and poaching. I believe that the Chinese government should see through the obsession of nationalism and take seriously the problems suggested in the article. After all, it is all about the health of the people.

However, the Chinese government's anxiety does come with historical background: modern medicine, which came along with the imperialism in China, menacingly challenged the local medical culture. Back then, the issue of medical system reform sparked various distinct propositions. Some proposed "wholesale Westernization" to embrace the modernity of Western medicine, and some others stood firm on TCM system as the Traditional culture. Concerning the development of TCM after the founding of the Republic in China, *Neither Donkey Nor Horse: Medicine in*

the Struggle over China's Modernity (2014),[4] by STS scholar Sean Hsiang-Lin Lei, suggest a precious gateway. He believes that, in that historical background, it was not merely about the struggle of traditional Chinese and Western medicines. Instead, it is better construed as a process of coevolution, in which "TCM" and "Western Medicine" as well as "the nations" sophisticatedly interplayed, and no one side succumbed to the other. This coevolution eventually gave birth to "mongrel medicine," to which the author refers to in the book. TCM then began to embrace the concept of biomedicine from Western medicine, applying Western scientific research methods to Chinese medicine and drugs. In other words, "mongrel medicine" brought forth by Lei is embodied by the case of modern Chinese Medicine, which incorporates the two types of medicine and sets itself apart from the traditional one. The new Chinese medicine is not the opposite of TCM. It is instead a new breed of medicine, which has challenged the cultural authority of science as the emblem of modernity and has become a pillar for China to explore its own modernity.

I am of the opinion that Lei's proposition of

4 Lei, Sean Hsiang-lin. *Neither Donkey nor Horse: Medicine in the Struggle over China's Modernity*. Chicago: The University of Chicago Press, 2014.

"mongrel medicine" breaks the East-West, tradition-modern, as well as humanities-science dichotomies. Based on the respect and tolerance for other cultures and different medical systems, "mongrel medicine" offers a different set of values, and it somehow responds to *We Have Never Been Modern* (1991) by Bruno Latour.[5] Latour proposes the metaphor of Modern Constitution, suggesting that all of our acts somewhat comply with this Constitution. However, the development of technology often results in things which are not allowed by this Constitution. People tend to fuse things from theoretically separated fields, create hybrids, and then reinstitute the things through purification to re-designate them in dichotomies (e.g., Nature vs. Society). Judging from the consequences, we seem to be eternally confined to dichotomies of this modern society. "Mongrel medicine" is the hybrid that is not allowed by the Constitution. It positions itself between "modern us" and "traditional others," which is promising to introduce new possibilities in this world of dichotomy.

Intrinsically, China's recent TCM policy can be regarded as the extension and promotion of the notion of "mongrel medicine," which is embodied

5 Bruno, Latour. Translated by Catherine Porter, *We Have Never Been Modern*. Harvard University Press, 1993.

in modern Chinese medicine, a new breed infused with Western science. However, for the time being, China's attempt to label this "hybrid" as a "pure breed" to construct national identity is fundamentally pertinent to the process of purification described by Latour. As what *the Economist* suggests, this rapid development of nationalism can bring about many problems. Apart from the issues indicated in the report, Elisabeth Hsu (2008) suggests in her research on Tanzania, Africa, that Chinese government's initiative in the late 90s to encouraged Chinese medical professionals/researchers to go to Africa to provide medical aid has concurrently provided an opportunity for Chinese private corporations to make profits.[6] Against that background, I wonder if it implies that China has taken advantage of TCM culture to impose colonization on African countries just as Western economic and cultural colonialism in those non-Western regions back then. Furthermore, China is not the only representative of TCM culture. The TCM in Taiwan, traditional Korean medicine in Korea, and Kampo in Japan and other mongrel medicines in other Asian countries are all descendants of TCM culture. On that account, China's exertion of monopoly over TCM culture has propagated

6 Elisabeth, Hsu. "Medicine as business: Chinese medicine in Tanzania", In Chris Alden ed., Daniel Large ed., Ricardo Soares de Oliveira ed., *China returns to Africa: a rising power and a continent embrace*. London: Hurst Publishers, 2008, pp.221-236.

monocultural imagery based on nationalism and consequently suffocates the seeds for different cultural representations.

My research interests focus on the domestic and international social problems that occur during the development of TCM culture. I will analyze deeply the particular environmental issue caused by animal-derived medicines, suggested in the Economist's report. Regarding the plant/animal-derived medicines, one of the topics to start off is to understand why TCM patients need drugs derived from endangered animals and plants, among which the most classic include ginseng, bear bile, tiger penis, and rhino horn. Each of those medicines has its particular purpose and efficacy. From a biochemical point of view, many of the plant/animal-derived medicines contain chemical substances proved useful in treatment, yet many of those are attainable through biochemical synthesis. That is to say, from a perspective of material substances, there is no sufficient reason for hunting and gathering endangered animals and plants. The high market demand for the drugs is driven by the conceptualization of cultural significance involved in these plant/animal-derived ingredients.

For instance, ginseng grows in a harsh natural environment, and it takes the shape of a man's body, therefore consuming it connotes the supplement of Jing Qi (Chinese: 精氣; essence and qi/vitality). In this case, it is not the material substance but the conceptualization of "qi" that is consumed. Long-lived wild ginseng of a rare strain is particularly deemed as anti-aging. Another example is tiger penis. The tiger symbolizes masculinity, and eating tiger penis equates to taking in the tiger's masculinity, which is later interpreted as virility enhancement. However, these cultural significances often contradict with modern Chinese medicine—the scientized Chinese medicine. For scientized Chinese medicine, the efficacy entails Western scientific experiments for proofs; however, the spirituality is not to be verified by the Western science. Does that mean the TCM culture loses grip on its cultural significances in the face of Western science examination?

For me, the conceptualization of cultural significances hidden in TCM represents the beauty and the poetic quality in traditional Chinese culture. The initiative to abolish these parts of traditional Chinese culture in order to fit in

the trend of “animal rights” in modern society and the concept of “biodiversity” in ecology is prone to the traditional-modern dichotomy. Thus, I hope to take advantage of my research and design practice to seek the resolutions of such social issues by emerging technology and science. Undoubtedly, in the process, a new “hybrid” is indispensable to reconcile the underlying dichotomies.

Chapter 2

Why Should Human Protect Other Animals?

Debate of Environmental Conservation

Why Should Human Protect Other Animals?

Chapter 2 is aimed to summarize the difficulties in attempting to preserve the practice of using animal products in TCM, which is not scientifically proven for its effects, to protect the cultural values in TCM, while faced with the concepts of "animal protection" and "ecological conservation." However, the core questions to delve into are why some people would advocate animal protection and ecological conservation, and what are the perspectives they hold. In chapter 2, various distinct viewpoints are sorted to give an account of the contemporary arguments that mankind should protect other species, and subsequently conclude on the collision between the concepts and the culture of Chinese medicine.

Concerning the arguments of "animal protection," multiple theorists have conceptualized the ideas from various perspectives. For instance, animal rights theorist Tom Regan believes that human beings have the consciousness to perceive the world and feel emotions, hence each human individual has his/her inherent value. Each person is the ruler of his/her own life, and no one can own another, which is embodied in the negation of the slavery system; one shall not discriminate others on the basis of race, gender, class and so on because each individual has his/her own inherent value. Animals, as a subject of life, equally have consciousness, and thus their inherent value shall not be disregarded. Advocates of animal rights believe that humans shall not utilize animals, for animals are not tools for humans. Therefore, the utilization of animals as tools for experiments and food and such are to be abolished.[7]

The view held by some of the conservationists is somewhat similar to the concept of animal rights theorists. Besides from believing that the life of an animal is as important as human life, they also regard it as necessary to treat nature in a moral and sacred fashion and to proceed conservation modestly and respectfully. Among all, the more representative view is the tribalist, who are

7 Regan, Tom. *Animal Rights, Human Wrongs: An Introduction to Moral Philosophy*. Maryland: Rowman & Littlefield, 2003.

convinced that deities and spirits reside within the nature and animals, therefore the destiny for human beings is to re-establish a harmonious relationship with all the beings. Based on this perspective, it is believed that the tribal way of life is the model; by taking this view to a more radical level, it is advocated that cooperation with tribes is necessary to proceed ecological conservation in co-existence with indigenous cultures around the world. However, such a concept is sometimes criticized as too idealistic, and the question raised is that: Do tribes coexist the nature out of respect or they have no choice but to succumb the environment due to the lack of technical development? In the end, do tribes respect the environment for its virtue? Alternatively, it is because of the slow technological development that they are forced to submit to the environment? Another representative point of view is preservationists, who handle the issue from a similar point of view. The iconic figure of preservationists is John Muir, the forerunner of the environmental movement in the United States. Muir contributed to the protection of wastelands such as the Yosemite Valley as well as the establishment of Sierra Club, one of the country's most important environmental protection group. His writings and thoughts

have significantly influenced the formation of modern environmental protection movement. In his book, he urges: "The forests of America, however slighted by man, must have been a great delight to God; for they were the best he ever planted."[8] Judging from Muir's words, it is clear that the faction's proposition is related to religion and they believe all natural beings are created by God. In this case, the moral of the religion and the ecological conservation issue are placed side by side. Due to this close tie with religion, their ideas might not be well received by those without religious beliefs.

Different from the tribalists and preservationists in their devotion and love to nature, those who believe in utilitarianism hold entirely different views. The common denominator of this faction is that: ecological conservation is seen as the result of calculating of net benefits rather than religious and moral responsibility.[9] Under this faction, there are various branches, among which the main difference is "whose" benefits are to be maximized. The idea of resource conservation is a branch conceived in the early stage of the faction's development. They argue that the protection of the environment is meant for the benefit of mankind so that the resources on earth can be

8 Muir, John. *Our National Parks*. Boston: Houghton Mifflin, 1901.
9 Singer, Peter. *Animal liberation : a new ethics for our treatment of animals*. London: Jonathan Cape, 1975.

garnered sustainably and bring more possibilities for the future mankind. Thus, the most crucial concepts for operation are equity and efficiency. The means invested in ecological conservation is determined by elements that can maximize the benefits of human beings and achieve the highest levels of efficiency, in turn nature will requite us in the future with returns for our investment. Put in other words, it is utterly out of a human-centered mentality. While such a mentality may sometimes be criticized for being overly selfish, it is often not a disadvantage when ecological conservation views are joined with the intention to retain humans' interests. For instance, the idea of conserving forests to be able to discover plants for the treatment of cancer is compelling to most people. Nonetheless, viewpoints held by different factions from time to time collide. Take San Francisco, the USA, for example, in 1912 the U.S. government attempted to build a reservoir in Yosemite Ally to supply water to residents of the San Francisco Bay Area. However, Muir, as mentioned in the preceding paragraph, opposed this construction. He believed that the best way to treat the environment was to keep it as it was. However, for those who are for the concept of resource conservation, ecological conservation should granted people controlled access to use

natural resources reasonably so as to achieve the highest utility under limited conditions.

Besides utilitarianism that is grounded on the interests of mankind. Ecocentrism is also popular, and it is supported by many of the biologists. The core concept of this faction is: the purpose of ecological conservation is aimed for "the entire ecosystem" instead of a particular species, religion, or resources. It is often accepted by the conservationists who support this point of view that alien species in an environment must be immolated for they destroy the local ecosystem. That is, it is acceptable to slaughter some animals to maintain the balance of an ecosystem. This point of view often conflicts with animal defenders who believe animals have the right to life.

In addition to the various points of view mentioned above, I am listing a few of factions that were formed more recently, which are not grounded on resources and benefits, religious beliefs, or moral values. Sustainable development was the view that first emerged in 1972, and it sought to strike a balance between humankind and nature, believing the harmonious co-existence of the environment, economy, and society is the key to bringing a good life for mankind.

This view is undoubtedly human-centered, but the idea has somewhat deviated from the framework of calculating values of ecological conservation by economic interests. Another faction to name is cornucopians, who are a group of people generally optimistic about technology. Instead of downplaying the importance of environmental protection, they argue that: the continued advances in technology will eventually overcome the limitations of the environment and subsequently allow human beings to live an abundant and prosperous life while keeping the ecosystem from collapsing. They believe that the workable circulation starts from economic development first, which allows us to accumulate enough money and resources to push science and technology advances so that we will be able to solve the environmental problems. Cornucopians are met with a fair share of objections. “Gods mill grinds slow but sure” is a compelling counter-argument considering causality. Another counter-argument refutes that below the surface of the idea of technology capable of solving problems lies the fact that developed countries exploit other regions to maintain the illusion that technology and economy can grow sustainably.

After going through so many different points of

views on environmental conservation, it is evident that these different views sometimes conflict with one another. Up till now, these views are in an endless debate at the philosophical level, and no single side can fully persuade the other. However, it is undeniable that the earth has indeed been faced with such a dilemma. Similar to the problem of using animal products in the culture of Chinese medicine, even though the Chinese government has outlawed the killing of endangered animals, poaching still takes place as found in other parts of the world. Therefore, I think it is obviously flawed to try to cram a variety of ecological conservation views to prohibit killing animals by law. My proposition is that we, mankind, must face our deepest desires and thereon devise a win-win solution. Therefore, in the research of my thesis, I tried to find a new path beyond common arguments and approaches. Besides, based on the confidence the cornucopians have in technology, I hope to take advantage of the emerging technologies to solve the complex problem of using endangered animal products in TCM. However, in order to avoid neglecting the significance of culture and morality, the use of technology is to be integrated with the method of social design in the process of my practice. Technology and design are to be incorporated in

light of perspectives of culture, economics and politics so as to avoid hegemonism over the others. The details of my practice are stated in Chapter 4, and chapter 5 is dedicated to an in-depth analysis and critics on my own practice.

Chapter 3

Is Tiger Penis Medicine, Placebo or Myth?

The Virtuality and Reality of Medication

Is "Tiger Penis" Medicine, Placebo or Myth?

Following the studies on "Chinese medicine" and "environmental conservation" in chapter 1 and chapter 2, the end is to devise a win-win solution, which should be under the condition of the continued consumption of animal products as medicine while refraining from killing endangered animals. That is an alternative option for the medicines have to be found. Therefore, before looking for the alternatives, it is necessary to understand the reasons for using animal products in TCM, of which the operating mechanism is examined from perspectives of TCM, Western science, and the myth of traditional culture.

As mentioned in chapter 1, each of animal-derived drugs in TCM has different therapeutic

effects, and reasons accountable for these effects differ. The ingredients can be divided into three categories. The first category of animal ingredients is the ones that are inscribed in ancient Chinese books and proven by Western scientific experiments. For example, bear bile has its medicinal value recorded in the ancient books of TCM, modern medicine has also proved that bile is effective for the treatment of gallstones. Its pharmacologically active compound is Ursodeoxycholic Acid, and oral administration of ursodeoxycholic acid is effective for dissolving some types of gallstones. The alternative solution for this type of animal ingredients is easier to find. Scientists can look for chemical compounds that have the same therapeutic effect through scientific experiments. Once the new substitutes are found, new drugs can be developed. In turn, TCM practitioners will be able to gradually replace traditional animal-derived medicine with the new drug. The second category is the ones that are recorded in ancient books of TCM while it not been confirmed by the modern science for its therapeutic effects. However, as long as there are records of the effects in the books, even though there is no scientific proof, generally a TCM practitioner would still prescribe medicines as such. Moreover, the scientists working with TCM

practitioners usually take up the mission to find scientific evidence, which is also a phenomenon in scientization of TCM. The last category is the ones not recorded in the ancient books nor proven by modern scientific experiments. The pharmaceutical effects are often passed by word of mouth, which is akin to a cultural myth, same as the instance of “Tiger penis” which is said to have virility enhancement effect. This is a type of medicines a TCM practitioner would usually not prescribe for clinical treatment, however purchased by people mostly in stores; and it is difficult for medical regulations to control such purchases.

Due to the lack of modern scientific evidence, the second and the third category are of belief system in the culture of TCM. In all likelihood, the lack of evidence in scientific experiments might be attributed to technology development not advanced enough. However, in the case that these medicines contain none of the specific chemical compounds, are these animal-derived medicines of any use? Perhaps, it is feasible to review the effects of these animal-derived drugs by referring to “placebo” effect in Western science. Placebo effect refers to the phenomenon in which a patient receives treatment with no active

therapeutic effect perceives an improvement in condition due to personal "expectations" or "beliefs" that the treatment is effective. The placebo effect was put forward by Dr. Henry K. Beecher in 1955. He documented in his research that approximately a quarter of patients taking placebos, in this instance the one claimed effective in treating back pain, indicated alleviation of the symptom. It is noteworthy that the improvement was not only registered by the patients' feedback but also measured by using objective methods. On the contrary, the relief of pain did not occur to patients who were not given placebo.[10] As a result of this discovery, government regulatory agencies began to require new drugs should pass clinical placebo-controlled tests to be approved. The test results are expected to demonstrate that patients respond to the drug, of which the effect should also be proven more effective in comparison with with the one of placebo-controlled tests ("effective" refers to two or at least one of the following: a. the drug has positive effects on more patients than placebo does, and b. the patient show stronger response to the drug than placebo). Since a physician's conducts might be influenced by the perception of practicability in the treatment programs, the test must be done in a double-blind fashion, meaning that neither the doctor nor the

10 Beecher, H. K. *The powerful placebo. Journal of the American Medical Association*. 1955-12-24, 159 (17): 1602–1606.

patient knows if the drug is placebo.

In other words, while there is no specific substance of pharmaceutical effects, placebo does prove effective for patients, which is similar to the case of animal-derived TCM drugs that are not scientifically proven. In Western medicine, there are cases of clinical application of placebo. A study conducted in 2000 suggests that 48% of general clinicians in Denmark use placebo interventions for more than ten times in the previous year. Typical placebos were antibiotics for viral infections or vitamins for fatigue (private specialists and hospital-based doctors reported to have used placebo interventions less frequently)[11]. In addition, in 2004, a study published in the British Medical Journal (BMJ) also notes that 60% of Israeli doctors use placebos. The main reasons for the use of placebos are to comfort patient or to "avoid" a patient's request to receive improper medication. Of all physicians who had used placebo, only 15% of doctors told patients they were receiving placebos or unspecified medication.[12]

The use of placebos has in fact elicited positive and negative response. Some consider it unethical

11 Hróbjartsson, Asbjørn; Norup, Michael. *The use of placebo interventions in medical practice-a national questionnaire survey of Danish clinicians. Evaluation & the Health Professions*. June 2003, 26 (2): 153–165.

12 Nitzan, Uriel; Lichtenberg, Pesach. *Questionnaire survey on use of placebo*. BMJ (Clinical research ed.). 2004-10-23, 329 (7472): 944–946.

to give treatments without pharmaceutical effects to patients and question that telling patients that placebo is a real treatment equates to deception, which can endanger doctor-patient relationship in the long run. Besides, there are critics and questions regarding the potential risks of delaying proper diagnosis and treatment of acute illness due to the use of placebo. However, others contend that that fact that placebo was proved invalid in clinical trials because the subjects knew they might be given placebo. However, in clinical application, placebo worked because the patients believed the drug was effective. Some empirical data show that placebo is capable of relieving pain, and it can be objectively measured. They believe the placebo's effect of "making patients feel pleasant" can boost recovery, and that is actually part of doctor-patient relationship.[13] [14]

Regardless of the positive and negative opinions, the research and discussions on the placebo effect are still going on. I believe the consensus on the use of placebo for Western medical application will take shape in the future. I think the facts of these studies can, in fact, be applied to the case of animal-derived medicine in TCM, especially the part that is not yet confirmed by scientific experiments. We can try to find the placebo as an

13 Di Blasi, Zelda; Reilly, David. *Placebos in medicine: medical paradoxes need disentangling*. BMJ (Clinical research ed.). 2005-01-01, 330 (7481): 45.

14 Barfod, Toke S. *Placebos in medicine: placebo use is well known, placebo effect is not*. BMJ (Clinical research ed.). 2005-01-01, 330 (7481): 45.

alternative by making it even more convincing than those animal-derived drugs to refrain from hunting down endangered wildlife. Hence, the critical factor is how to build stronger beliefs than what those animals symbolize. For example, the virility enhancement effect of “tiger penis” in fact come mainly from word of mouth. Because the tiger itself in the Chinese culture symbolize masculine qualities such as fierceness, strength, people believe that such a masculine quality converges in its genital and human beings can obtain its masculinity and potency if they can consume its genital. Therefore, “tiger penis” denotes an abstract cultural significance, which in turn extends to serve as placebo at a cultural level. In other words, if a placebo to replace tiger penis is to be found, it is necessary to design a myth much more masculine and potent than the tiger superstition—a stronger cultural placebo.

However, it should be noted that such a cultural approach to carrying out the design of medical treatment may not always be safe. For instance, there was a traditional culture in Romania, where newborns injected with adults’ blood through umbilical cord in the hope that babies will grow faster and healthier. However, in 1990, this custom resulted in many babies being infected with HIV

through transfusion of blood and consequently the cases of acquired immunodeficiency syndrome (AIDS). The well-intended cultural practice as such resulted in irreversible consequences.[15] Therefore, in the process of making cultural placebo, it is imperative to conduct with sufficient medical knowledge to avoid any factor that might cause life-threatening risks for a patient, so as to ensure the placebo to be a safe measure.

The original definition of reality in medication should denote the chemical mechanism of medicines; that is to say, the patient recovers because the drug taken heals the patient's illness due to specific mechanism of action. However, in the concept of placebo and cultural myths, there are no scientific and factual effects. Therefore, is the effect is still considered real? Under any circumstances, placebos and myths often retain the function of relieving patients' pain; Medication effect viewed from the perspective of placebo effect, it clear that the medical effect is not virtual, and it might as well be construed as a new definition of reality.

15 Bohken, Celestine. "UPHEAVAL IN THE EAST; Romania's AIDS Babies: A Legacy of Neglect", *The New York Times*, February 8, 1990. www.nytimes.com/1990/02/08/world/upheaval-in-the-east-romania-s-aids-babies-a-legacy-of-neglect.

Chapter 4

Design Practice

Design Practice

The fourth chapter recounts the practical practice of the design project of this thesis, and this project centers around a TCM ingredient—"tiger penis." The reason for selecting tiger penis as the subject is that tiger penis is different from other animal organs, such as bear bile, that is scientifically proven to be effective as medicine. Because of that, there is no easy way to find a substitute for tiger penis merely through scientific methods. Hence, I am of the opinion that the approach of social design is needed in the formula to search for an alternative solution.

In TCM culture, tiger penis is believed to be effective in enhancing male virility. However, the specific records have not been found in

ancient Chinese medical books, neither is there the evidence from modern scientific experiments. The pharmaceutical effect of tiger penis is presumably passed down by word of mouth, and therefore it shall be considered to be more of a cultural myth. Due to that fact that the tiger is an endangered species, the trade for TCM ingredients derived from tigers is no longer allowed by law. In addition, in light of the strong backlash from international media, the prohibition against hunting wild tiger has been expressly provided in China. However, poaching still exists, and tiger penis might still be available on the black market.[16][17][18] This situation manifests that the effect of outlawing the hunting of wild animals is still limited. On the contrary, viewing from a different perspective, a part of TCM culture is about to perish due to the prohibition. In order to achieve a win-win situation—of protecting this perishing culture and refraining from hunting wild animals as well as destroying the ecology, this design project is intended to propose a new solution, an unconventional and brand-new outlook as the answer to this conflict—by utilizing emerging technologies and design methods of

16 Davies, Nick and Holmes, Oliver. "China accused of defying its own ban on breeding tigers to profit from body parts", *The Guardian*, September 27 2016. www.theguardian.com/ environment/2016/sep/27/china-accused-of-defying-its-own-ban-on-breeding-tigers-to-profit-from-body-parts.

17 Guynup, Sharon. "China's Threat to Wild Tigers", *The New York Times*, June 28, 2014. www.nytimes.com/2014/06/29/opinion/sunday/chinas-threat-to-wild-tigers.

18 Ruble, Kayla. "China Outlaws the Eating of Tiger Penis, Rhino Horn, and Other Endangered Animal Products", *VICE*, May 2, 2014. news.vice.com/article/china-outlaws-the-eating-of-tiger-penis-rhino-horn-and-other-endangered-animal-products.

modeling experiment and public engagement.

4.1 Visual Experiments

In TCM culture, the idea behind the myth of the eating of tiger penis for male virility enhancement is called "Yi Xing Bu Xing," which means that an ill person can consume an animal organ or part to nourish or heal the corresponding or similarly-shaped human organ or body part. For instance, eating pig liver is good for our liver. The consumption of tiger penis is a cultural myth that formed under such a conceptual context. Against this background, how shall an alternative solution be designed? Due to the maturation of technologies for tissue culture and 3D bioprinting in recent years, scientists and commercial companies have been working collaboratively to synthesize cultured meat using these technologies to ameliorate the worldwide crisis of food shortage.[19] Therefore, it seems feasible to produce "artificial tiger penis" by utilizing those technologies. However, such an idea might be problematic. For example, in recent years, scientists have attempted to take advantage of the technology to synthesize "artificial rhino horn." However, it turns out that the endeavor might not

19 "Our Meatless Future: How The $90B Global Meat Market Gets Disrupted", *CBINSIGHTS*, November 9, 2017. www.cbinsights.com/research/future-of-meat-industrial-farming/?utm_content=bufferb5e98&utm_medium=social&utm_source=facebook.com&utm_campaign=buffer.

succeed in replacing the market demand for wild rhino horns; instead, the demand would probably increase. The problem is that the new market for synthesized horns will only serve as a cover-up for continuing illegal trade. Also, since the faux-horns are physically and genetically identical to the real ones, authorities will have a hard time telling the two apart. This may lead to poachers claiming that the horns they were bringing were actually cultured, allowing them to continue unpunished. Another major concern is that, if allowed, the marketing campaigns of the various companies that produce these synthetic animal parts may inadvertently drive up poaching activities. Such efforts often create more demand from consumers, even as products from wild animals and plants continue to command a premium over synthetic or farmed alternatives.[20]

Therefore, the interviews with four TCM practitioners from Taiwan were conducted and subsequently a decision is made to propose a novel solution plan—to establish a new belief system of virility enhancement using technology to synthesize the medicine which is more potent than tiger penis. By setting this new belief system significantly apart from the old one, it is hoped that the myth of tiger penis is to be obsoleted in

20 Sanders, Robert. "The Age of Biotech: Can Bioengineered Rhino Horns Bring An End to Poaching?", *Futurism*, September 23, 2016. futurism.com/the-age-of-biotech-can-bioengineered-rhino-horns-bring-an-end-to-poaching.

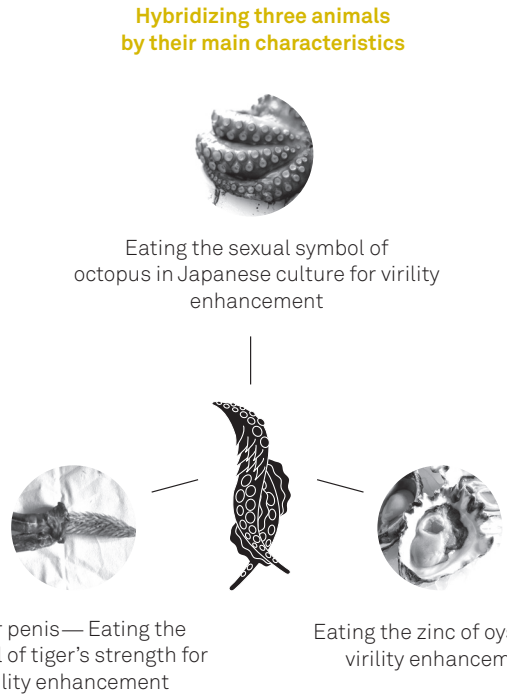


Fig. 5 Hybridizing three animals by their main characteristics.

the market. Because the genesis of this "belief" came from the conviction in "Xing" (Chinese: 形; literally means shape or form), it was decided that the alternative solution should be reinforced in the context of this "Xing" culture. Hence, I started the process by selecting the animals that are considered to have properties of male virility enhancement in different cultures. The "Xing" belief of virility enhancement implied by each animal is divergent. For example, the implication of the tiger is mainly about the animal's strong and ferocious image. However, it is not only TCM culture that has this sort of myth; this type of cultural phenomenon exists across the world. For instance, oyster is a kind of aphrodisiac or the tentacles of octopus represents a sensual symbol in Japanese culture. Therefore, at this stage, the intended goal is to deconstruct the shapes of these creatures and to retain their most imposing forms that denote male stamina and virility. For this stage, the actual technical details are temporarily put aside, and the attention is steered to the experiments for the visual representation, through which a new hybrid creature is to be made. The technical details for the production procedure are to be elaborated in Chapter 4.2.[Fig. 5]

The first modeling experiment was conducted

Fig. 6 Sculpture of the hybrid penis.

to morph together the images of tigers, oyster, and octopus to design a number of different models of synthetic creatures using painting, prototype modeling. After completing the design, the second round of the interviews, focused on the appearance of the prototypes, with the TCM practitioners were conducted, and they were expected to give their opinions as to which prototype was more compelling from on their clinical experience and the perspective of TCM. Based on the practitioners' suggestions, the second round of modeling experiment was conducted to improve and make the appearance of the prototype more convincing, and at the same time, eliminating those of less connotation of virility enhancement.[Fig. 6] The practitioners provided invaluable suggestions during their interviews, such as the importance of representing an impressive visual image. For instance, in the scientific procedure of extracting Ganoderma for medicine,[21] it is usually the mycelium that is

21 Ganoderma is a genus of polypore mushrooms that grow on wood, and include about 80 species, many from tropical regions. Because of their extensive use in traditional Asian medicines, and their potential in bioremediation, they are a very important genus economically. Ganoderma can be differentiated from other polypores because they have a double-walled basidiospore. They are popularly referred to as shelf mushrooms or bracket fungi.

22 Mycelium is the vegetative part of a fungus or fungus-like bacterial colony, consisting of a mass of branching, thread-like hyphae. The mass of hyphae is sometimes called shiro, especially within the fairy ring fungi. Fungal colonies composed of mycelium are found in and on soil and many other substrates. A typical single spore germinates into a homokaryotic mycelium, which cannot reproduce sexually; when two compatible homokaryotic mycelia join and form a dikaryotic mycelium, that mycelium may form fruiting bodies such as mushrooms.

Fig. 7 Ganoderma as traditional Chinese medication (online image) www.grapeking.com.tw/tw/home , www.libogene.com.tw/linzi. <March 29, 2018>

used.[22] However, in ancient books, the illustrations are mostly of the sporocarp.[23] Therefore, most of the packages for Ganoderma-derived pills are represented with images of the sporocarp.[Fig. 7]

4.2 Technological Process

After reviewing the visual images of the synthetic creatures designed in the modeling experiment, this chapter is to specify the technologies and techniques entailed for the application. Even though there might not have been the actual application of some of the emerging technologies mentioned here, the theoretical feasibility is to be presented here. Additionally, some of the technologies that are not to be practically performed in today's society owing to ethical reasons are to be discussed for the feasibility at a scientific level.

Regarding the creation of this hybrid creature, the first element to discuss is genetic engineering. Based on the understanding of synthetic biology, it is known that nowadays even an organism can be used as a component in industrial production chains. For example, in the medical field, in order to synthesize insulin for people

23 In fungi, the sporocarp (also known as fruiting body, fruit body or fruitbody) is a multicellular structure on which spore-producing structures, such as basidia or asci, are borne. The fruitbody is part of the sexual phase of a fungal life cycle, while the rest of the life cycle is characterized by vegetative mycelial growth and asexual spore production.

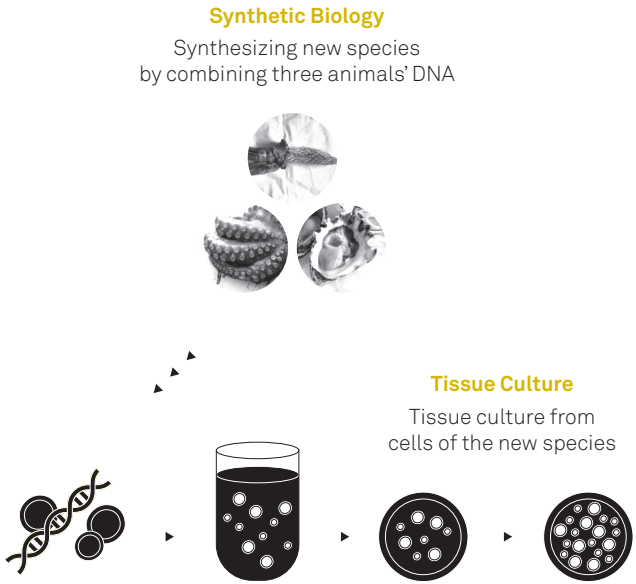


Fig. 8 Synthetic biology and tissue culture.

with diabetes, scientists have attempted to insert a fragment of DNA responsible for producing such protein as insulin into E. coli. So the E. coli can perform the function meant for this DNA fragment to synthesize insulin constantly. In this case, E. coli becomes a new synthetic organism created by humans because it is inserted with a DNA fragment that is not its own.[24] By using such a genetic technology in this project, it is attempted to sequence the DNA of the creatures such as tigers, oyster, and octopus that boast the connotation of virility enhancement, to synthesize cells of the new synthesized creature. Undoubtedly, this involves the identification of the genetic sequences of each creature and what are the DNA sequences to be put together, but it is not impossible at a theoretical level. Fig. 8

With the cell containing the genes of various creatures, the next step entails the technologies of tissue culture and 3D bioprinting to develop a specific organ of the synthetic creature as the ingredient of the new virility enhancement pills. First of all, it entails a 3D printer to print the mold of the synthetic creature's organ and to insert cells into the structure of this mold simultaneously. After that, this blob of tissue is to be placed in a sterilized incubator for temperature and humidity

24 Itakura, K.; Hirose, T.; Crea, R.; Riggs, A. D.; Heyneker, H. L.; Bolivar, F.; Boyer, H. W.. "Expression in Escherichia coli of a chemically synthesized gene for the hormone somatostatin". *Science*. 198 (4321): 1056–1063, 1977.

Fig. 9 3D bioprinting of hybrid tiger penis.

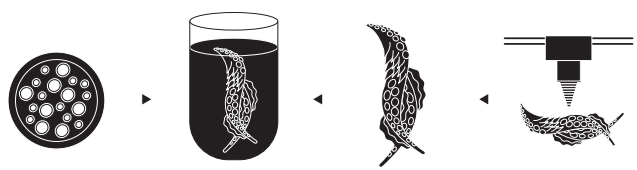


Fig. 10 Tissue culture and 3D bioprinting.

control. The structure of the synthetic creature consists of the hydrogel as the printing material, and the cells are printed simultaneously inside the hydrogel structure. Different organ requires a different set of cell composition. For instance, the formation of a penis involves epithelial cells and connective tissue cells, among others. Therefore, a synthetic creature's organ can be made just by employing hydrogel and different cells as the materials, and it shall then be developed in a sterilized incubator. Concerning this part of the technology, the discussion between scientists who are specialized in tissue culture and I has been continued to avoid an imagination distant from actual science so as to base this design on biological science rather than empty talk and fantasy.Fig. 9 Fig. 10

4.3 Speculative Design and Public Engagement

In this project, due to legal restrictions, some of the technologies still cannot be implemented in the design practice at this stage, including genetic modification of animals. Thereby, at this stage, the approaches of speculative design and critical design are utilized to create a fictional scenario. For the scenario, a series of objects, images, and

performances or activities are offered to allow the viewers to experience the ethical, economic and political debates that might appear in the future society where the pills have been invented.

According to the interviews with the TCM practitioners, clinical treatments given to patients with sexual dysfunction normally depend on the patients' respective problems, e.g., low sperm count, lack of endurance, and insufficient hardness. The medicines prescribed varies with symptoms, and the problem is not to be solved by using a single type of animal/plant-derived drug. Besides, in most cases in TCM treatment, a combination of various animal/plant-derived medicine is prescribed accordingly to a specific symptom. On the contrary, Viagra—of the Western medicine—can provide immediate effectiveness against sexual dysfunction once taken, while TCM virility enhancement medicine is often consumed chronically to reboot the balance within the body. Based on the above knowledge, for this future scenario to be created, there will be a new form of a habit of taking such a virility enhancement medicine. This habit is a combination consisting of TCM and the Western medical practices. And it is used in different combinations to treat different symptoms.

According to the conventional production methods of TCM virility enhancement medicine, a number of creatures are to be soaked in white spirit for about a month, and then the medicine shall be taken a cup per day. Therefore, in this future scenario, a similar fashion is being employed to create a new diet culture for virility enhancing effects. After this virtual virility enhancing food are created, workshops are to be held for the public to participate to experience the various kinds of hybrid virility enhancing food. Additionally, a series of group discussions are to be organized to allow the participants to exchange views on this type of novel food that binds the Eastern and Western cultures. Besides, this kind of food that cannot tell to be real or fake is often seen in life. For example, crab stick from Japan is an example of popular “fake” food. It does not actually contain crab meat, but it has formed a new fashion of eating and has become a new kind of food. Furthermore, some questions might be raised among these instances and discussions: What is the value of such type of fake food in human society? Is this kind of food analogous to the belief system in TCM? Considering the storied formed by food and virility enhancement are divergent in different cultures, are we able to create a new story of food and medicine?

Taking into consideration that the Western virility enhancement pill—Viagra—along with some recreational drugs often accounts for the drug-taking habits in some subcultures, will this new enhancement pill become a part of recreation and culture? What are the issues and dangers to be taken into consideration beforehand?

Furthermore, a series of questions are raised in the workshop for participants to think about and to establish their respective cultures of the new food and drugs in each participant group. Besides, another question is that: if we can come to deal with the issues such as animal conservation, the preservation of TCM culture, and other types of social conflicts through the establishment of such a story? Before the events are to be held, engagement with reporters are made to make the public aware of such activities and works through media reports, and through sharing the information on social media, the views of the general public on this proposal of virility enhancement pills can be collected, which can be utilized in this design project for further revisions and reflections. Furthermore, media reports can also serve as a channel for the general public to know about this project and to experience this future scenario.

Chapter 5

Analysis and Critique

5.1 Interculture
Techno-Orientalism to Asian Futurism

5.2 Interdiscipline
Art/Design+Science/Technology

5.3 Interspecies
Practice of Transhumanism/
Posthumanism

Analysis and Critique

In this chapter, my role is turned into a researcher to analyze and critique the entire project. This chapter is divided into three parts: interculture, interdiscipline, and interspecies. The project is evaluated and critiqued from these three perspectives.

5.1 Interculture
Techno-Orientalism to Asian Futurism

Pakistanis designer Ahmed Ansari, who teaches in the U.S.A, mentioned in his speech given for the debate over Critical Design at the MIT Media Lab Summit, 2015, “Where are the missing masses whom critical designers do not address? Hell,

where are all the colored, the queer, the feminist, the working class people in critical design?"[25] He thinks that nowadays a multitude of future speculations in critical design is centered around white, middle-class, heterosexual men. As a designer from non-Western world. He believes solving the current problems is more imperative than forecasting the future, and it is usually white, middle-class designers' interest to look at how technology influences the future. I do agree with some parts of his argument; however, I am reserved about other parts. In my opinion, the white middle-class still have a say in the field of design, and therefore the critical design and speculative design works that are covered by media or talked about in design history are often white-centered. The works of those types are more than usually conceived from the perspective of the white middle-class to speculate the future, and in that future, minorities are always absent. However, are critical design and speculative design never to be useful tools to explore the non-Western world? I hold the opposite view. Take this design project for example; it begins from the perspective of a perishing Chinese traditional culture to speculate the future scenario in which the struggle between East-Asian culture and Western values is addressed. This future scenario

25 Ahmed Ansari, "Design must fill current human needs before imagining new futures.", The transcript of the speech given for the motion by Ahmed Ansari at the MIT Media Lab Summit, 2015 muaddib86.files.wordpress.com/2014/10/speech.pdf.

is not designed to serve the white middle-class but to deal with the sophisticated environmental and cultural problems facing East Asia. In other words, it is not these "design" approaches that exclude the minorities. For non-Western designers, instead of blindly denying the design tools of critical thinking, we should take command of these tools and bring forth the future speculation of minorities, which for me is the responsibility of a male designer who is not Western, white nor heterosexual.

In 1995, David Morley and Kevin Robins proposed "Techno-Orientalism,which is the revision and reflection of "Orientalism" proposed by Edward W. Said. Techno-Orientalism is the stereotype of East Asia portrayed by the West, especially the U.S.A., as high-tech, cold-blooded and inhumane judging from the technology development in modern Japan, China, and other East-Asian countries. Moreover, gradually the stereotype was inflected in the narratives of multiple sci-fi novels and movies. Nonetheless, in recent years some East-Asian scholars have begun to write about Asian Futurism which is extended from Techno-Orientalism,[26] however, with a rather positive image. The reason for that is mainly because

26 They had already introduced the neologism in David Morley and Kevin Robins, "Techno-Orientalism: Futures, Foreigners and Phobias," *New Formations 16* (1992): 136–56. Nevertheless, the term begun to be used by other scholars after David Morley and Kevin Robins, "Techno-Orientalism. Japan Panic," in Spaces of Identity. Global Media, Electronic Landscapes and Cultural Boundaries (London: Routledge, 1995), 147–173.

recently some Asian artists have been reversing the negative image of Techno-Orientalism through their works and presenting Asia's attitude towards emerging technologies and the future from an Asian perspective.[27] [28] Although the definition of Asian Futurism is still vague, in my opinion, these scholars did put forth a new gateway to break away the thinking of ossified stereotype. The simultaneous development of these theories is critical to the future proposal that I am developing for a solution to issues of East-Asian traditional culture. On the hand, it seems promising that there will be increasingly more sophisticated ideas on pluralism in the near future, and the stories to be told by creators will no longer be aimed just for a single group of people. The prospect of pluralism is to be expected.

In this design project, it is attempted to explore how to reconcile the collision between East-Asian traditional culture and Western values. I believe the idea of "hybrid" which I propose in the project is expected to represent an East-Asian way of thinking for the future; yet, it is not merely an Asian perspective but also a response to the global issues such as biodiversity and animal ethics that occur in globalization. In other words, this kind of creative approach is capable of

27 Xin Wang. "Asian Futurism and the Non-Other", *e-flux*, April 2017. www.e-flux.com/journal/81/126662/asian-futurism-and-the-non-other/.

28 Dawn Chan. "Asia-Futurism", *Artforum*, Summer 2016. www.artforum.com/inprint/issue=201606&id=60088 .

tackling regional cultural issues but also different sorts of fast-changing global social issues. If a research methodology is to be extracted from this case, it could be applied to minority cultures worldwide. Moreover, this precondition is to make this case study more than just a research on Chinese traditional culture, but a tool, a design methodology that can be widely applied.

This design project proposes a new idea as a solution to the East-West culture struggle, and it has made an absolute contribution to the discussion on racial issues. However, if it is to be reviewed from the perspective of "gender," there seems to be quite some room for further research and revision. Concerning gender perspective, Judith Butler, a gender theorist, thinks that the significance of a body is not inherently determined. A body is not just of a biological sense. The internal reality and essence demonstrated by a body are constructed by the society and the culture. Therefore, the gendered body is performative, that is, gender is a stylized repetition of acts. By Butler's words, it can be understood that a gendered body might be constructed through a repetitive performance, of which the process is of culture and the result of an individual's interaction with the outer world.[29]

29 Butler, Judith. *Gender Trouble: Feminism and the Subversion of Identity*. New York and London: Routledge, pp. 128- 41, 1990.

In this design project, the virility enhancement drug symbolizes a masculine characteristic which capitalizes stereotype of male qualities such as the tiger's masculine strength. That is to say, the scenario, in which a biological man reclaims his missing masculine strength through medication, implicitly reinforces the idea that a "biological man" is supposed to demonstrate his masculinity. In the moment when gender movements are gradually opening up the gender diversity, does such a design project pose an obstacle to the development of this pluralism and thereby reinforces a gender homogeneity? Judged from the perspectives mentioned above, perhaps a further revision is needed to be made for this project in order to satisfy a wider variety of gender positions. In other words, there will be more possibilities and aspects of further examination and research after the completion of this Master thesis.

5.2 Interdiscipline
Art / Design + Science / Technology

This design project, conducted under the precondition of social design, combines diverse approaches such as three-dimensional and

visual design, speculative design, and public engagement to study the possibilities of combining traditional Chinese and Western medicines and the ensuing ethical issues that might arise due to the application of emerging biotechnologies. The aim of this type of interdisciplinary creation and research is to break free from the limitations of a single disciplinary perspective. In the field of art and design, there are many works that take advantage of approaches that combine art/design with science/technology. Therefore, a number of examples are introduced in this section of the chapter as the case study to analyze the similarities and differences among this project and other projects, as well as the deficiencies and benefits of interdisciplinary artmaking.

Analysis and Critique

In regard to using tissue culture as a technique to make art, the most symbolic case is *The Tissue Culture* and *Art Project* initiated since 1996 by Finland-born artist Oron Catts and UK-born artist Ionat Zurr. In the project, they made a series of artworks by exploring the artistic expression of biological tissue culture as the medium. In 2004, Oron Catts and Ionat Zurr made *Victimless Leather* under *The Tissue Culture* and *Art Project*. Utilizing tissue engineering technique, they created a miniature jacket, 2 inches high and

1.4 inches wide, from mouse connective tissue and human bone cell. Through this prototype, it is accentuated that the moral problem of killing animals to make leather jackets could be resolved with the help of tissue engineering, and a victimless condition can thus be reached.[30]
The goal of this project is similar to my proposal in the sense of animal ethics. Besides, the project involves "tissue culture" technique which is to be used in this project as well.

Although the focus of both projects is on such biotechnology as tissue culture, back then, Oron Catts and Ionat Zurr paid more attention to the ethical problems of using biological materials for artistic creations. Considering their work contained living cells, the matter of introducing works containing living cells into an art space such as a museum did cause issues that would otherwise not happen.[31] [32] Contrarily, my work focuses more on reconciling the collision of traditional Asian culture and Western values other than the matter of biological materials. For this reason, a future scenario is devised so that the audience can test drive the solution I propose and then think about how the solution reflects the current problems we face.

30 www.tca.uwa.edu.au
31 Ionat Zurr and Oron Catts, "Are the Semi-Living Semi-good or Semi-evil?," in *Technoetic Arts: A Journal of Speculative Research*, 1 (1), 2003, pp. 47–60.
32 Adele Senior, "Towards a (Semi-)Discourse of the Semi-Living; The Undecidability of a Life Exposed to Death," in *Technoetic Arts: A Journal of Speculative Research*, 5(2), 2007, pp. 97–112.

On the other hand, *Meat the Future* (2014)[33] by "Next Nature Network" stalks about how people in the future will use cultured meat to solve the crisis of food shortage and create new food culture, given that it has been possible to grow "cultured meat" using tissue culture techniques. They engage in speculation as a method, using virtual objects, recipes and books, and films to build up a future scenario for the audience to experience and then reflect upon. Their approach is similar to the speculative scenario in this project. However, for this project, the collaboration with a lab is intended to reason and conceive the procedure of making a prototype based on scientific theories, and this part is different from the sheer speculative project of *Meat the Future*, which skips the scientific research.

However, in the absence of rigorous scientific research, is there any problem for a design project to merely predict the future of biomedical science and technology? *The anatomy lesson: dissecting medical futures*, a work by British designer Agi Haines made for the residency at Waag Society in Amsterdam in 2016,[34] Haines is very skilled in realistic sculpture. For the residency, she made four sets of sculptures and installations, each representing a speculated future medical

33 www.nextnature.net/projects/meat-the-future
34 waag.org/en/event/anatomy-lesson-dissecting-medical-futures

technology, and the objects on display were realistic human-body sculptures and related medical devices made by her. The viewers could put their hands on the devices and interact with the sculptures of organs to experience the future of medicine speculated by the designer. The work of the project consisted of four metal podiums. The topics for each podium are as follows: 1. Ophthalmology— Removal of cysts caused by artificial eyeballs, 2. Brain science — Observing a brain state from the transparent cranium, 3. Thoracic surgery— examining if the nanoparticle molecular sieve in trachea needs to be replaced, 4. Dentistry: transplanting teeth in teratoma to mouth. Such artworks allow people to feel the sensation presented by the realistic sculptures, considering the field of medicine is usually highly professional, most people are not familiar with such knowledge system, and that the general public is entirely unfamiliar with such a knowledge system. Therefore, Haines successfully provided the viewers with s new path through which can have a glimpse of medical knowledge.

However, judging from my clinical experience from the past six years as a dentist as well as the knowledge learned at dental school, there were many misleading uses of the scientific devices

in the fourth set of installations that is about dentistry. She selected a wide range of devices that are typically used for root canal treatment in dentistry, but the instruments needed for her speculated scenario should have been the surgical ones rather those of root canal treatment.
Such mistakes make it difficult for medical professionals who come to the exhibition to be fully immersed in the future scenario that she created. Besides from the misleading uses of the instruments, many aspects need to be questioned from a theoretical point of view. Theoretically, the teeth in teratoma usually come in an irregular shape, and if the teeth are to be transplanted to the edentulous area, the problem of malocclusion is expected to occur. The unpresented knowledge indeed causes obstacles for the viewers with the dental knowledge to fully engage with the work during viewing process. Likewise, it might be doubted whether the same problems occurs to the other sets of works. Could it be that I was just not familiar with the knowledge of other medical fields, so I could not tell if the medical language was used correctly? Therefore, it is clear that rigorous scientific research is crucial in medical-related design; otherwise, the validity of the artwork will be compromised.

On the other hand, the practice of designer Tobie Kerridge's project *Material Beliefs* (2013)[35] is considered a more comprehensive inclusion of the approaches mentioned above, which is similar to my project. In addition, both projects employ actual biotechnology and collaboration with scientists to conduct scientific research before establishing a future scenario through the methods of speculative design and public engagement.[36] I am of the opinion that this way of research approach, rather than the static display of objects, is capable of bringing the audience closer to the future scenario. With experience activity, the public will be more closely connected with such projects. However, Kerridge's design practice is mostly focused on biotechnology of the West, thus incapable of critiquing the nature of Western science. On the contrary, my project is navigated between the territories of Chinese and Western medicines, and thereby it presents a point of view unaddressed by most Western speculative designers and demonstrates the ability to challenge the definition of biological science.

Apart from the cases related biotechnology mentioned above, another case study to mention is Iranian artist Morehshin Allahyari's artistic practice. For her work *Material Speculation: ISIS*

35 www.materialbeliefs.co.uk

36 Kerridge, T., Custead, S., & Gaver , W. *Material Beliefs - Collaborations for public engagement between engineers and designers*. IDEAS Factory, case for support, EPSRC standard proposal. Goldsmiths. London, 2006.

(2015-2016),[37] she used 3D printing technology to restore ancient statues in the Middle East that had been destroyed by ISIS and then stored the files of the digitally reconstructed models in flash drives that were later placed in the 3D printed models. For the latest work *SHE WHO SEES THE UNKNOWN* (2017-2018),[38] she collects illustrations of ancient female djinns and ancient goddesses, speculates the images of those djinns and goddesses, and re-appropriates the figures of feminine power through displaying the ancient text and image archive. In these two projects, Morehshin uses 3D printing and related modern technologies to approach the issues of her tradition and even takes it further to preserve the vanishing culture and tradition with technology. Morehshin's practice to employ state-of-the-art technologies to approach traditional Asian cultures, often unintelligible to the Western world, is an entirely suitable reference for my research. Notably, her artistic approach to use of digital images and 3D printing to convert abstract image and spirit of the Middle Eastern goddess to materialize and visualize the untranslatable spirituality is a valuable example for me to tackles issues regarding Asian culture.

Although the contemporary technologies we use are not the same, we both attempt to

37 www.morehshin.com/material-speculation-isis
38 www.morehshin.com/she-who-sees-the-unknown

use Western technology to interpret our own cultures which are of Asia and inscrutable to most of the Westerners. What is shaped by the process of this creative project is a new hybrid culture which takes advantage of technology to integrate the East/West struggle to generate a completely new scenario and provide a channel for different nationalities to better understand each other beyond the cultural barriers. On the other hand, the feminine power of the Middle-Eastern goddess she dealt with and the masculine quality in East-Asian medicine that I addressed forms an interesting contrast, while both of us uses technology to materialize abstract gender traits. In contemporary society, there have been a number of cultural conflicts around the world in recent years. If such a creative approach can help integrate different cultures and allow different nationalities to understand each other better, I believe the values in this creative project is to be of great importance to a world in turmoil.

5.3 Interspecies Practice of Transhumanism / Posthumanism

The suffix of transhumanism and posthumanism suggests that the dialogue topic is about

"humanism." The term "humanism" is often used to refer to an idea that emphasizes secularism and rationality (as opposed to theology); moreover, it also elevates the position of humanity and infuses us with the confidence of our ability to transform and conquer nature by means of technology.
On the other hand, in the dialogue between ultra/posthumanism and humanism, the connotation of "anthropocentrism" is generally referred to.

In the worldview of humanism, the use of technology for human beings mostly plays the role of therapy as to "restoring normal functions of a human" just as glasses or prosthetics. On the contrary, for trans/posthumanists, technology serves a purpose of enhancement in "enhancing human function." transhumanism was first proposed by Julian Huxley in 1957 to discuss the possibility of using technology to improve life expectancy, IQ, or health. The concept of posthumanism was shaped at a set of conferences on cybernetics held between the 40s and 50s, sponsored by the Josiah Macy, Jr. Foundation. The conferences aimed to discuss on how the technologies and issues such as cyborg, chimera, and artificial life would redefine human beings and challenge the boundaries between humans, animals, and robots.[39] [40]

39 Hayles, N.K. "How We Became Posthuman: virtual bodies in cybernetics, literature, and informatics." Chicago & London: The University of Chicago Press, 1999.
40 Tirosh-Samuelson, H. "Transhumanism as a Secularist Faith". Zygon, 47(4), 710-34, 2012.

As soon as the discussion on trans/posthumanism unfolds, there comes a problem: the consensus on the definitions and relations of trans/posthumanism has not be reached in academia, which results in barriers to communication. Some people consider them to be synonyms that can be used interchangeably, and others suggest that the difference lies in in the degree of the discrepancy. For instance, scholar N. Bostron considers transhumanism and posthumanism to be the two major human evolution stages in the future: when the goal of technology development to modify our body transitions beyond our human biological limitations to the extent that we can manipulate the collocation of human, animal, and machines at will to adjust our physiological functions, we will see transhumanism give way to posthumanism.[41]

Transhumanism inherits and extends the spirits of reason, progressiveness, and humanism as of the age of Enlightenment to pursue the goal of "better human." Posthumanism, on the other hand, sublates this ideal from a perspective of postmodernity and further reflects on the problems of linear progression and humanism, and in turn pursues the goal of "better than human." Therefore, posthumanists discuss the human position in the world through a systematic

41 Bostron, N. "Transhumanist Values". Review of Contemporary Philosophy, 4, 3-14, 2005.

perspective where human and non-human are to be seen. Even though the values reflected through the two concepts are not mutually exclusive, they are also significantly divergent.[42] [43]

By using the discourses of trans/posthumanism to review this design project, it is clear that the use of medicine to improve sexual dysfunction or even enhance the existing sexual functions of the body, to some extent, echoes the transhumanist idea to pursue the extension of a human body function. On the other hand, the synthetic creatures created for the new virility enhancement pills in the project break the boundaries among species. In addition, the reason for synthesizing this creature is aimed to allow mankind and other creatures to live in the ecosystem in a balanced manner, and that responds to posthumanist ideas of blurring the boundaries of species and pursuing the balance among species. In recent years, there have been some art projects that echo trans/posthumanism, among which are *I Wanna Deliver a Dolphin* (2014) by Japanese designer Ai Hasegawa and *Lichen in Love* (2016) by Pole designer Karolina Ferenc. In the project *I Wanna Deliver a Dolphin*, it is imagined that humans will be able to give birth to other species in the future. Due to overpopulation and food

42 LaGrandeur, K. "What is the Difference between Posthumanism and Transhumanism?", 2014. ieet.org/index.php/IEET/more/lagrandeur20140729.

43 Scott, K. "Transhumanism vs. /and Posthumanism", 2011. ieet.org/index.php/IEET/more/scott20110714.

shortage, it is expected to be increasingly difficult for humans to raise children, while mankind might still retain the desire to reproduce.[44] Meanwhile, many other species are facing an extinction crisis. In this project, Hasegawa visualizes a scenario in which humankind can give birth to endangered dolphins, thereby alleviating the extinction crisis of other species and fulfilling the human desire to reproduce. For *Lichen in Love*, Karolina Ferenc designed an array of objects, which can be used by humans to help bryophytes grow by acts such as giving light or water. Contrarily, some of the other objects can make bryophytes helpful for humans; for instance, bryophytes can be sent to outer space for environmental tests on other planets.[45] These projects seek to propose the possibilities of peaceful coexistence between human beings and non-human beings, which resonates with many of the ideas emphasized by posthumanism.

However, as designers put forward these works, how exactly can we, humans, know what other species need? In the ancient Chinese philosophical book of *Zhuangzi*, from the chapter "Qiu Shui" (Autumn Floods), a story goes as following: Zhuangzi and Huizi were strolling on a bridge over the River Hao. Zhuangzi said, "See how free the fishes leap and dart: that is their happiness."

44 www.aihasegawa.info
45 www.karolinaferenc.com/Lichen-in-love

Huizi replied, “Since you are not a fish, how do you know what makes fishes happy?” Zhuangzi said, “Since you are not I, how can you possibly know that I do not know what makes fishes happy?”[46] The discussion between Zhuangzi and Huizi implies a philosophical proposition: how can one understand the feelings of another species? Moreover, is it possible for one to fully understand the feelings of the other person’s? Some designers did manage to find a way to answer this philosophical question. The collaborative project PSX Consultancy, presented in 2014 by Taiwan designer Pei-Ying Lin, Slovenian artist Špela Petrič, Slovenian architect Jasmina Weiss, and British designers Dimitrios Stamatis, is an example. PSX Consultancy was a virtual company whose primary mission was to solve the reproductive problems for their vegetal clients, and it was a design consultancy that emphasized plant-centered perspective. Its mission was to accept the commission of the vegetal clients for whom the company would devise new designs inspired by nature or culture to meet the needs of reproduction. The designers at this virtual company used *Human-Centered Design Toolkit* (2009) published by IDEO[47] as their design guidelines for the execution of the plant-centered design, except that they converted the object from

46 Zhou, Z. (476–221 BC). The Debate on the Joy of Fish. chapter “Qiu Shui”, *Zhuangzi*.

humans to plants.

Human-Centered Design Toolkit emphasized the need to use the interview as the main sources of information and design development and to timely revise the design according to the clients' feedback. However, since plants were not capable of receiving an interview, the designers had to adapt the papers of scientific research on plants into first-person statements as the input for their design. The reproductive problems of plants were analogously similar to humans' sexual problems. Hence, the designers personified the plants and assumed that they could receive an interview from the consultancy. By utilizing the information collected through this fashion of interview, the designers designed a number of sex toys, of which the purpose is to make plants reproduce smoothly.[48] Although these designers emphasized that their design was based on rigorous botanical research, it is obvious that scientific research is not able to serve as a method to fully represent the thoughts of the plants. Hence, this project successfully employed a satirical approach to ridicule the design methodologies in IDEO's *Human-Centered Design Toolkit*; after all,

47 IDEO is an international design and consulting firm founded in Palo Alto, California, in 1991. The company has locations in Cambridge (Massachusetts), Chicago, London, Munich, New York City, Palo Alto, San Francisco, Shanghai and Tokyo. The company uses the design thinking methodology to design products, services, environments, and digital experiences. Additionally, the company has become increasingly involved in management consulting and organizational design.

48 www.psx-consultancy.com

we human beings alike are not able to fully understand the other person's ideas.

To conclude, under the trend of posthumanism, many of the designers endeavor to apply the methodology of design viewing from the perspective of other species to the designing of a future where humans and other species can coexist harmoniously. Although it was revealed in the previous paragraph that we cannot fully understand what the other species think, as a member of the planet, it is still our responsibilities to make every effort to understand other creatures around the world. The same applies to our own kind, and we shall attempt to understand our human peers of different races, genders, and classes to avoid conflicts among our species. Even though such an approach sounds like an endeavor to construct a posthumanist utopia, I am convinced that we are to march to the ideal world, where all beings are equal, step by step, even if the world cannot be transformed completely. I believe that a world of equality is a direction that requires all of our efforts and it is also is the most critical spirit and idea in this design research project.

Conclusion

The first three chapters are respectively dedicated to the topics of TCM culture, environmental conservation, and the placebo effect. In those chapters, the problems of consuming organs of endangered animals in the TCM culture are elaborated, and the fundamental knowledge is presented to examine those issues. The details of the final design project, grounded on the findings of the pilot studies in the first three chapters, is recorded in the three subsections of Chapter 4. In chapter 5, my role is transformed into a researcher to analyze and critique my own design project, through the three perspectives as mentioned above.

This thesis uses the approach of design to combine

different medical knowledge or theories, such as TCM, emerging biotechnologies, and the placebo effect found in the Western medicine, to create new "hybrid medicine." This new hybrid medicine can be understood as a system that "hacks" the conventional medical system and topples the framework of the existing system. While being constructed, the new system simultaneously succeeds in demolishing the existing power structure of the medical system. One of the core values of this research is to disturb the "integrity" of the medical system and the scientific system. However, what is the reason for these efforts of disturbance? In the field of biomedicine, scientific research is controlled by the hierarchy of academic system, and knowledge systems fail to function actively outside academia. In recent years, many people have been promoting the ideas of DIY Biology, Biohacker,[49] and so on. They strive to liberate biotechnologies and scientific knowledge from the academies for the public, which is similar to the concept of citizen science.[50] Despite that this design project is still under the operational framework of the academic system, the entire

49 DIY Biology or so-called Biohackers who build their own laboratories at home use easily-accessible ingredients to conduct experiments. The core idea is to break free the conception that biological experiments can only be done in the laboratories of academic institutions and to popularize science.

50 Citizen Science (also known as community science, crowd science, crowd-sourced science, civic science) is scientific research conducted or scientific events participated, in whole or in part, by amateur, non-professional or volunteer scientists. The topics of the events usually range from science-based problems, emerging technology, to data collecting and analysis. The events are usually collaboratively initiated by citizens and scientists.

project is not conducted in the conventional fashion of scientific research. Instead, it adopts an approach tilted to art and design to deal with the struggle between Eastern and Western cultures which scientific research is incapable of handling. On that account, can “hybrid medicine” I put forth still be considered “medicine”? With this question raised, the definition of medicine is to be re-examined, and it will be one of the primary topics in this thesis.

In addition to challenging the existing medical system, my work is intended to propose a solution to the conflict between the Eastern culture of traditional medicine and the contemporary Western concept of environmental conservation. Through this path, my work is aimed to find a win-win future. This research is not just to deal with TCM culture in East Asia; it is aimed to establish a methodology that is applicable to other traditional cultures to deal with the conflicts between cultures and the modern concept of environmental conservation. For example, the design approach is also adopted in another piece of my work, “Mosquito Fight” (2017), to deal with the struggle between a Southern-French cultural tradition and animal ethics. In Arles, in the South of France, there is this tradition of

bullfighting similar to that of Spain. Even though the tradition of killing bulls is harshly condemned as an act of cruelty by animal protection groups, the locals still hope to preserve it. Hence, how to solve this conflict has become a problem. After researching, the findings showed that there was a high number of mosquitoes in the Arles region in the summer. Mosquitoes carry diseases, which might lead to public health problems. Therefore, the inspiration of combining the two issues in my project came along. For the project, a series of “mosquitoes fighting” performance were designed in hope to replace the tradition of bullfighting. In the fighting, a mosquito fighter has to be dressed in specific suits as in bullfighting and also equipped with mosquito fighting tools. The project is designed to fight against the high number of mosquitoes in the summer of Arles and to establish a form of performance that the public can enjoy. Performance as mosquito flighting is expected to fulfill humans’ desire to see performers battle with animals and to reduce the health problems posed by mosquitoes. This design project example demonstrates that the research methodology I employed is not only applicable to the East to deal with Chinese traditions but also elsewhere around the world to handle all sorts of issues through creative endeavors.

Conclusion

Besides, this design research manifests that "design" can serve as a research methodology to explore "science-based issues" that science is incapable of handling. In the social structure of contemporary capitalism, in order to meet the needs of an industrialized society, there must exist an occupational structure of high degree of specialization that enables the entire society to function. Accordingly, educational and academic structures, corresponding to the occupational structure, have respectively formed academic pinnacles due to a high degree of specialization among the fields. As a result, between the pinnacles there seems to be some degree of knowledge fractures. Under the taxonomy of academic disciplines in the modern college system, academics at institutes of science, engineering and medical study the knowledge of nature, machinery and even the body, while the academics of humanities and social sciences at liberal arts or law schools focus on the interactions among people, society, and culture. Scholars in sciences often overlook the relationship between their research and the society. On the contrary, scholars in humanities and social sciences maintain a distance from research on technology and scientific development. Because of such

a fracture, many problems have occurred. For instance, the research topic of this thesis—TCM—is an Oriental science which is not recognized by the Western one, and the former conflicts with the ecological conservation issue in the context of the latter. Such a situation is indeed a cultural issue which scientist may find difficult to deal with. In addition, the issue as mentioned earlier entirely reflects the alarming fractures among disciplines. However, according to this research, the creative approach of "design" can serve as a channel of communication, bridging the gap between humanities & social sciences and scientific research, and further provide a solution to such problems for a better future.

This thesis firstly challenged the definition and the nature of medicine. Through the challenge, the conflict between Eastern and Western cultures is resolved, resulting in a "inter-cultural" hybrid. Moreover, it is demonstrated that "design" can serve as a research methodology to deal with the barriers between the field of science and technology and the field of the humanities and social sciences, and further establish a new "inter-disciplinary" practice. Lastly, the result of this design project provides a win-win solution to peaceful and harmonious coexistence between

Conclusion

humans and other species as well as an outlook to imagine a brighter future. Put another way, it is namely a post-humanist practice. Anticipation for "inter-species" caring is needed when we are faced with the era of "Anthropocene."

Conclusion

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Hybridizing Medicines
Tiger Penis Project

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