

WHEN TRADITIONAL CULTURE MEETS MODERN SCIENCE AND TECHNOLOGY

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Abstract

In the 21st Century we are searching for a new horizon of science and technology. The possibilities of new findings exist not only in the future, but also in the past. When Japanese traditional culture meets modern science and technology, new idea or product might be born. Inside mobile phone you can find various emerging technologies derived from Japanese traditional arts and crafts; manufacturing skill and knowledge of paper, porcelain, and golden foil. Another cases are related with new application of Natto (Japanese fermented soybeans), and modern product from Japanese traditional steel manufacturing. This research is sponsored by Ministry of Education, Culture, Sports, Science and Technology (MEXT) in Japan[1].

Keywords: Traditional Arts and Crafts, Modern Science and Technology, Mobile phone, Natto, Steel Manufacturing

1. Introduction

Japan is a country of modern science and technology. At the same time Japan has a traditional culture as an Asian country. In the 21st Century we are searching for a new horizon of science and technology. The possibilities of new findings are not only in the future, but also in the past. When Japanese traditional culture meets modern science and technology, new idea or product might be born. In this paper I show successful examples of marriage of modern technology and Japanese traditional culture in mobile phone, Natto and steel manufacturing.

2. Japanese Traditional Crafts Heritage Inside Mobile Phone

Mobile phone is compacted by modern ICT and materials. However you can see various Japanese traditional crafts heritage when you take your mobile phone apart .

Flexible print wiring technology is derived from traditional golden foil or crafts manufacturing in Japan. On manufacturing extraordinary thin copper foil, very delicate human sense and tacit knowledge of handling technique are needed. Fukuda Metal Foil Powder Co. has 40% share in the world. Founder Benseki Fukuda begins trading in metal leaf/powder in Kyoto at 1700[2].

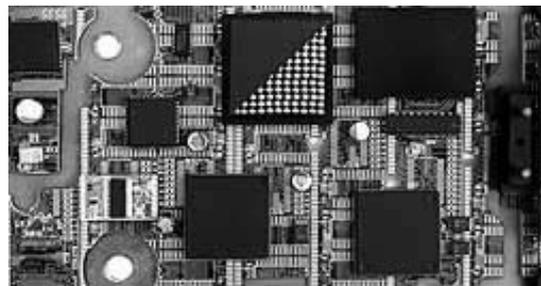
Slim ceramic filters in mobile phone are derived from the technology of Kiyomizuyaki porcelain. Murata Manufacturing Co. has 70% share in the world.

Separator for capacitor in mobile phone is derived from Japanese traditional papermaking technology, which is very strong and functional paper .NKK has 75%.world share in this field.

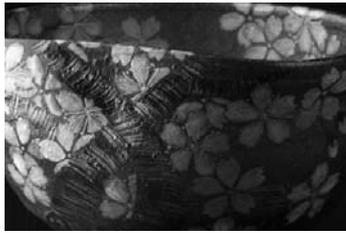
Key sheet dying in mobile phone is from traditional Yuzenzome dying technique which is called *nassen*.



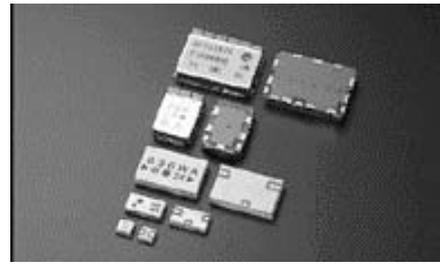
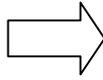
Traditional golden byobu (folding screen)



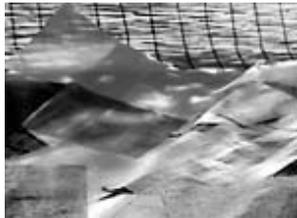
Electrodeposited copper foil on print wiring
(Fukuda Metal Foil Powder Co.)



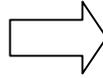
Kiyomizuyaki (porcelain)



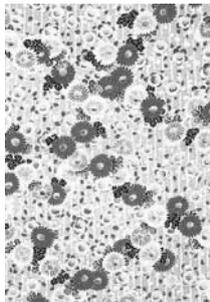
Ceramic filters for mobile phone
(Murata Manufacturing Co.)



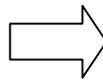
Japanese paper in Tosa



Separator for electrodeposited capacitor
(NKK Co.)



Yuzenzome (traditional dying in Kyoto)
(Yuzen Bunka Kaikan HP)

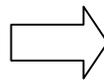


Key sheet in mobile phone

Not only Japanese traditional technology but also traditional culture is living in mobile phone. Nowadays many Japanese (especially younger) decorate their mobile phone with various designed strap. Some strap smells and other is lightening when they receive a call. Strap is a symbol of private use. I think the cultural roots of the mobile phone strap is Netsuke. Netsuke is a traditional accessory attached with pouch or pill case which were very popular in Edo Era.



Pill case and Netsuke
(National Museum of Japanese History)

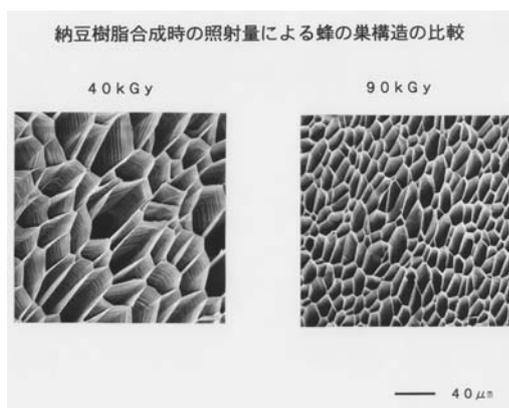


“Keitai-kunkun” ;Smelling strap
(Pixen Inc.)

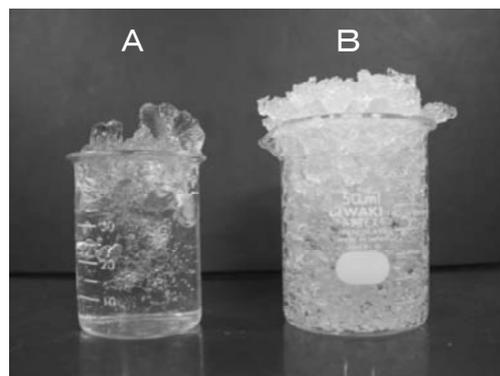
3. Natto Develops New Frontier

Natto is a Japanese traditional food, fermented soybeans, and famous (or notorious) for the unique smell and stickiness. Natto is supposed to come from Yunnan, China. Fermented soybeans are popular in the East and South Asia.

Dr. Hara started his study on Natto for teaching a postgraduate student from Austria. He made focusing on the sticky Natto string. Ingredient of Natto string is a γ -polyglutamic acid. He threw electronic beam on the Natto string, and found the Natto string turned into an absorbent, biodegradable and ductile polymer.



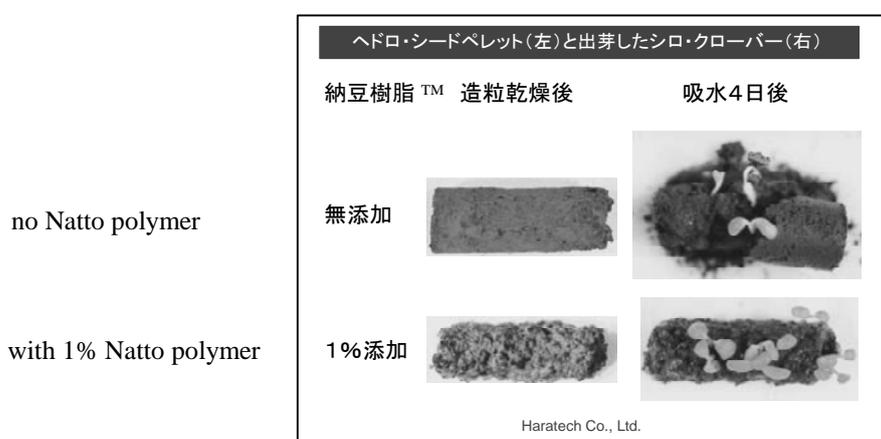
Honeycomb structure of Natto Polymer after the electronic beam shot



1.8グラム 1.5グラム

Natto Polymer absorbed water (T.Hara)

He made humidor jell for cosmetics and atopic dermatitis from Natto polymer. He is planning the tree-planting project in dessert by using Natto polymer which is very absorbent[3].



Experiment; seed pellet with Natto polymer and sprouting (T.Hara)

4. From Traditional Iron to Modern Products

Hitachi Metals Ltd. is proud to continue the ancient tradition of crafting quality blades[4].

At 3rd Century the traditional steel manufacturing technology from China or Korea diffused in Japan. They made steel from sand iron and charcoal for Japanese sword and agricultural plow or sickle. Especially Japanese sword is very sharp, flexible and firm, and therefore expert skill is necessary. .

After Meiji Era Japan took a course of modern steel manufacturing system. On the contrary in 1899 five founders of traditional steel manufacturing established a small steel manufacturing company in Yasuki, Shimane Prefecture. Later this company changed into Hitachi Metals Yasuki Factory. Hitachi Metals' special steels (named YSS) is very famous in the world for high quality. World share of spare razor blade of YSS is over 50%. YSS are also used in jet engines cutter , fuselages and cutting tools in the various application.



Traditional steel manufacturing



YSS steel for high-quality blades (Hitachi Metals Ltd.)



Various cutting tools (Hitachi Metals Ltd.)

In Japanese myth a young hero fought with a giant snake in this area and found a powerful sword from the snake's tail. Modern YSS blades might succeed the myth of the sword.

Shimane R&D center for next generation is developing carbon coating on steel by plasma technology.



Carbon coating on steel by plasma (Shimane Pref.)

5. Conclusion

“Learn a lesson from the past (Onko-Chisihin)” is a Japanese popular proverb (original is Chinese).

Technology in the 20th Century is searching for the universal utility and the leading edge.

Technology in the 21st Century might be added more local knowledge and cultural aspect.

I name this *Neo Indigenous Technology* (NIT). Not only Japan but also every country has his own culture and history.

Look forward the future ,look back the past, and integrate at present for the future.

6. References

- [1] Institute for Future Technology, “When Japanese Culture meets Science; from Tradition to Creation” ,2005
- [2] Homepage of Fukuda Metal Foil Powder Co.
- [3] Toshio Hara, “Natto saves the Earth” Ryokuhu No.2,Kyushu University,2004
- [4] Homepage of Hitachi Metals Ltd.
- [5] Institute for Future Technology, “Study on Fusion of Science & Technology and Culture & Art.” ,2004