

Interpretation on Shell-Culture

Wen-Lung Wu

Research Center for Biodiversity, Academia Sinica,

Keywords: Shell-Culture, Shell, Humanity, Austronesian, Biogeography.

Today, the relationship between islands to islands in Austronesian is still reticular and difficult to understand. We try to bring out an idea which combines anthropology and biology. It may provide a new way to research on the humanity, also the shells.

From the view of “humanity-shell”, Pithecanthropus used shells as food, ornaments, and tools for hunt, weave, and container. Antiquity used shells for merchandise as money, medical treatment, such as medicine, and building materials more than early purposes. Even now the civilization imitates the function of movement of nautilus to build the great vehicle- the nuclear submarine. Shells are everywhere around the world, closely linked to people.

From reverse view of “shell-humanity”, the biogeographical province of shells can be clearly divided into 16 areas, each containing a high proportion (at least 50%) of species which were absent from all other provinces. Comparing with the distribution area of Austronesian, the Indo-Pacific area of biogeographical province of shells is almost the same scope. So base on these two directions, we wish to find more relationships between humans and shells.

Preface

In human societies, beads have many different functions, all eminently symbolic (D'Errico, 2003; Ambrose, 1998; Kuhn, *et al.*, 2001). In April 16th, 2004, *the Science* journal, published a topic about an archaeological excavation led by Dr. Christopher Henshilwood showed something astonishing (Henshilwood, 2004). This team discovered clusters of deliberately perforated shell beads, the *Nassarius kraussianus*, 41 in total, that are 75,000 years old, making them 30,000 years older than any other previously identified personal ornaments.

In Taiwan, the earliest document after 1946 discuss about relationships between shells and humanity should be the “The shell beads of Atayal tribe of Taiwan in Department of Anthropology, National Taiwan University”, written by Guang-Zhi Chang (the Former Vice-President of Academia Sinica):

-Our exhibition hall collects many shell beads of aborigines of Taiwan, belonging to Atayal, Amis, Paiwan, and Bunun Tribe; most of these collections came from Atayal Tribe. The culture and history of shell beads of aborigines, including all collections in National Taiwan University, did not have any science descriptions or researches. However these beads must be important symbolizations of culture history of Taiwan-(Chang, 1946)

In 1958, after large works of references study and arrangement, Prof. Chang published another article, “the origination and dissemination of the culture history of shell beads of aborigines in Taiwan”. In this paper, Prof. Chang firmly inferred how the shells effected the culture and history of past human life:

-Inside the evolution of human civilization, shells were not like stones or bronzes used for making implements. It never heard the “Shell Age” in history. Nevertheless, shells had been hugely collected for food, ornaments, handcraft, even currency, completely went into human’s life, not only a snatch. The influence of shells in North America during the Neolithic Age, even was bigger and powerful than the effect of stones. There was a sound that the anthropology should add a “Shell Age” in human’s history. At old Continent, the shells were also everywhere in human’s society-(Chang, 1958)

From these directly and backhanded evidence, we can smell something indistinctly about the relationship between shells and humanity. Studying shell beads may be a nice attempt on knowing the correlation between different Tribes in Taiwan. After that, here comes a blank without any further research on this topic in 40 years. Till February 2001, “Conference on Purposes of Shells in East Asia at the Ancient Periods”¹ held at Academia Sinica published three issues about usages of shells in human’s life. This huge gap brought this topic into silence with no advances.

¹ “The shell industry of Taiwan at Prehistory” written by Zhao-mei Lian , Taiwan; “Inferring the meaning of shell rings from the comparison of Sheng-Wen Age (繩紋時代) and Mi-Shen Age (彌生時代)” written by Naoko Kinoshita, Japan; and “The shell merchandise and shell currency – discussing purposes of sea shells at Shang-Zhou dynasty of China” written by Yung-Di Lee, Taiwan.

Recently, topics about Austronesian have been discussed extensively, and Taiwan is the member of Austronesian. Because of the geographical location, language variety, and clan diversification, Taiwan has been set at the major position. Many reports about the relationship between shells and humanity have been issued meantime. Dr. Pei-Yi Guo, an Assistant Research Fellow of Academia Sinica, Taiwan talked about shells and humanity at “Encounter and Entanglement Between Local and State Currencies: Historical Anthropology of Shell Money in the Solomon Islands”.

-Between the confusing races and cultures, the discussions about local currencies and state currencies are the major topics for the Anthropology recently-(Guo, 2003)

And a paper on the title of “Humanities Interpretation and Value-Added on The Taiwan Malacofauna Database” published at 2003 Digital Archives Value-Added Conference:

-About three to four hundred million years ago, the Cambrian, the mollusks were ready to stay on earth. Today, 120,000 species of mollusks are living with us. They are flourishing and multipurpose for human being to use. As foodstuff, shells are the main sources of protein. We can find the evidence from shell mounds all over the world. The varied shell shapes and colors of shells provide great materials for collecting, enshrining and science research. Human made handicrafts and furnishings which were adorned with iridescence pearl colors. The ancient Chinese used shells as materials of medicinal use. In the Eurasia, we can also find lots of totems and characteristics using the pattern of shells. Shells were popular been used in business trade, such as money. These behaviors were frequently happened in human society. We shall see the inseparable relationship between mollusks and humans-(Wu, et al., 2003a)

We can roughly perceive that the development of research on communications of peoples to people gradually turns to study on the flow between province to province, and shells are important leads to help research into humanity. We believe, in this blank area, must have lots of knowledge to discover. These discoveries will need savants from Malacology, Anthropology, Ethnology, Geography and maybe Biogeography to cooperate with, in order to reach unprecedented fields.

Background

● Austronesian and Biogeography

The Austronesian language group, Austronesian for short, probably enjoyed the widest physical dispersion of a single language family prior to the European colonial expansion following Columbus. From the island of Madagascar, off the east coast of Africa, all the way to tiny, isolated Easter Island (Rapa Nui), and extending into Taiwan, Vietnam, Northern Australia, New Zealand and most of the Melanesian and Polynesian Islands, the languages in this single family show the common ancestry by the many cognates present.

-Austronesian Languages once is the largest language family of the world, including more than 1,200

regional languages. The Distribution of Austronesian Languages was north to Taiwan, south to New Zealand, west to Madagascar, and east to Easter Island. The width range is bigger than half of the earth- (Cheng, 2002)

And the biogeography is a science about researching on the divergence of biological distributions. This knowledge tries to talk about the relationship between living things and their environment from time and space (Watts, 1968; Cox and Moore, 1993). For a long time, the Indo-West Pacific area of biogeography was north from Japan, south to the northern coast of Australia, and west from the eastern coast of Africa, east to Micronesia Islands. This area is always acknowledged to be the center of biodiversity (Shao, *et al.*, 2003). Again we compare the Zoogeographic Regions of the World (Fig. 1) with the distribution of Austronesian. The Austronesian is almost the same as the Oriental region which includes the Pacific island arcs, southern of Asia, and Oceania, north from Japan, east to Polynesia Islands, west to Indian, and south to the northern coast of Australia.

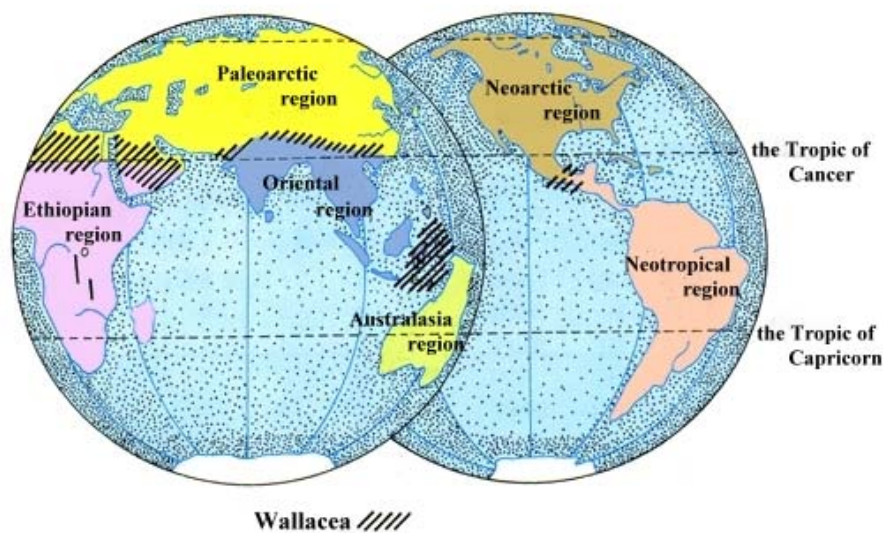


Fig. 1. Zoogeographic Regions of the World.
(Map modified from [Biomes](#), Department of Geography, NTNU., Taiwan)

From the descriptions of “The Digital Museum of Pioneer Projects of National Science Council- The Pingpu Culture”, we can also get another inference about the relationship between the distribution of Austronesian and Biogeography.

-the reason we talk to the Wallace’s Line (Fig. 2) is the differentiation of two groups of Austronesian. Demarcation of two groups almost overlaps the Wallace’s Line. This differentiation bases on the characteristics of language: one is Eastern Austronesian or Oceanic; another is Western Austronesian or Hesperonesian- (cited from the website of Pingpu Research Group, <http://www.sinica.edu.tw/~pingpu/> , Academia Sinica., 1999)

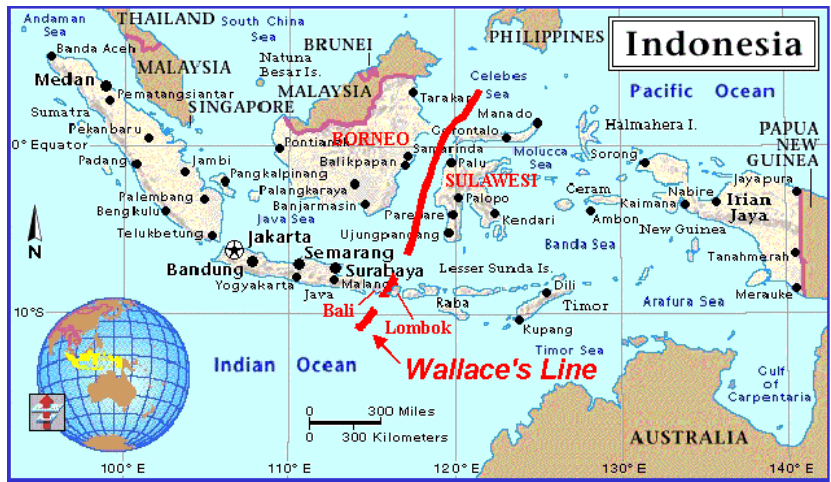


Fig. 2. Map of Wallace's Line.

(Map cited from [Wallace's Line](#), Department of Geography, Radford University, Virginia)

● **Shells and Biogeography**

"The Collector's Encyclopedia of Shells", written by Peter Dance in 1974, assays the divergence of different species of mollusks (Dance, 1974). He puts all shells into 16 provinces (Fig. 3). Each contains a high proportion (at least 50%) of species which were absent from all other provinces. As mollusks do not recognize political boundaries, it is more scientific and much more convenient to refer the actual.

Among these provinces, the limit of Indo-Pacific area is as follow: Indian Ocean and Pacific Ocean from Suez and Durban on the west to Clipperton Islands on the east and comprising all the island groups of the Indian Ocean, Australia north of Brisbane on the east and north of Geraldton on the west, Polynesia, Melanesia, Indonesia and islands and coasts northwards to Korea and the China Sea.

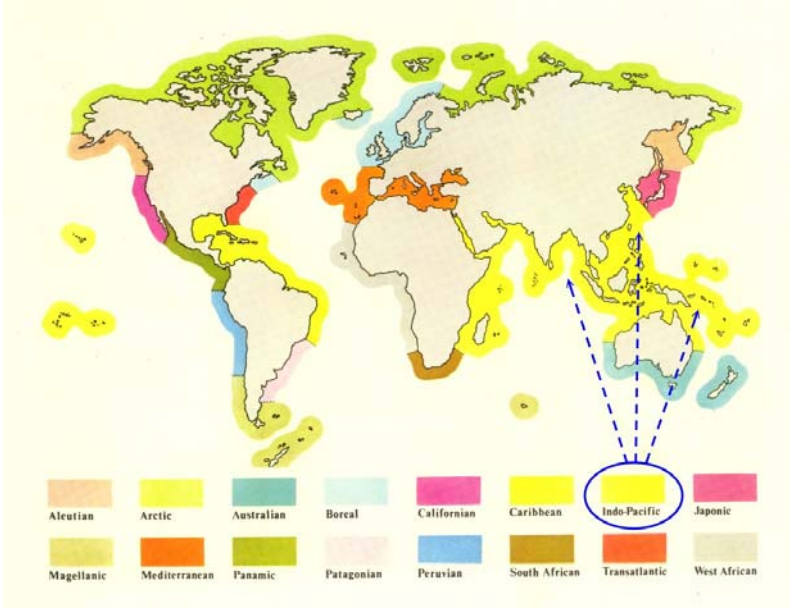


Fig. 3. 16 Principal Provinces of World Mollusks (Dance, 1974).

- **Shells and Austronesian**

From the description of above two sections, the “Austronesian and Biogeography” and the “Shells and Biogeography”, we can probably deduce how the shells get connect to the Anthropology and how the Anthropology might use the shells as an implement for further study, especially for Austronesian. Since human being is a kind of animals, the developments of human’s behaviors should approximately match the main development of all biological behaviors inside this area (environment). Studying on the relationship between shells and human’s life, such as food, cloth, living, movement, education, and leisure, to know the expansion of different cultures, this must be a reasonable and important basis.

Application between Shell Research and Humanity Discovery

From the linkage of shell and humanity, we try to organize six main topics which are “Shells as food in Indo-Pacific Area”, “Shells as clothes in Indo-Pacific Area”, “Shells as living in Indo-Pacific Area”, ”Shells as transportation in Indo-Pacific Area”, “Shells as education in Indo-Pacific Area”, and “Shells as leisure in Indo-Pacific Area”. Through these frequently and ongoing interactions, we can discuss the further questions and someday we might understand the evolution of Austronesian from shells:

- **Shells and Human’s Food**

From ancient times to the present, we can find shells as food all over the world. The evidence can be the shell mounds from excavations everywhere. In Taiwan, sites or relics from many excavations usually contain hunting or fishing tools and the calcareous remains after meals. From these discoveries, Shells collections are the same important as others fishing or hunting activities for food resource (Davidson, 1976). Carefully investigating these shell mounds, especially recently large archaeological excavations like Shi-san-hang in Bali and Yuan-shan in Taipei city, the most remains of shells were identified as clams. From the record of great medicinal encyclopaedia of China, the *Ben-Tsao-Gang-Mu*, dried snails can be used to quench thirst, diuretic, fester, and detumescence. The Indians in North America put the shell powder into chewed coca to enhance the curative effect for relieving pain.



Traditional Haka food with squid



Common Fukien food with clam



concentrate from corbicula as medicine

● Shells and Human's Wearing

Among the aborigines of Taiwan, the Atayal has a unique and special dress. This dress was worn only for chieftains, elders, the bravest warrior, or couple in wedding. We called it “Bead Dress” which was a handmade dress weaved by tiny white shells, shell beads, and pearls (Wu, 2000). Other tribes sometimes use shell beads to make “Bead Cap” (for chieftains only), “Bead Skirt”, and leg wrappings. Bead skirts usually be treated as a symbolical gift that the parents of bridegroom's side show gratitude to the parents of their daughter-in-law. The Luke recorded a paragraph about the “Purple Gown”, its violet and gorgeous color was dyed by stains refined from Muricidae (Class Gastropota). Same instance also happens in China. The article, “Value of purple dress and purple dyeing” recorded it for early history (Wang, *et al.*, 1988).



Necklace of Aborigine, Taiwan
with cowrie



Common Hair bun with
Plicarcularia bellula



Common dress pin with
mother-of-pearl of abalone

● Shells and Architecture

The hard parts of shells are composed of calcium and nacre. With bright and dazzling burnish and uncorrupt properties, in Asia people would like to use these stony materials for decorations, adornments, or building materials. The elegant, luxurious and famous furniture decorated with polished nacre is the mother-of-pearl inlay (Arakawa, 1985; Tokugawa Art Museum, 1999). This artistry astonishment brings lot of foreign exchange for Taiwan and other countries. The early aquatic products industry in Taiwan produces tons of oysters, and most weights of these aquatic products comes from its lime shells. People are good at calcining these shells to be cement for shed building, and sometimes for wall daubing. Now we can see these architectures at western coast of Taiwan, Penghu islands, and Kinmen islands.

Sometimes we can find spiral stairways, may be for beautiful, space-effect, or other reasons. The Guggenheim Museum at New York also displays the upside down snail shape for its space and external design. New generation of large-scale construction design, in order to bring the largest space, save materials, and get the best strength, they have been designed for the shell-like outside and interior. Because the research submarine can meet the bivalve in deep oceans with highly pressure.



Guggenheim museum with shell shape



shells calcining for construction



Shell Temple at Taiwan – build with many kinds of shells

● Shells and Human's Transportation

At the Shang Dynasty of ancient China, the horses leading the carriages carried decoration made by clam on their forehead. Today, roaming through the south-western coast of Taiwan, around areas which cultivate oysters, we can see paths built by shells of oysters everywhere. World first nuclear power submarine was designated as Nautilus because the mechanism of diving control imitated from a nautilus. When people travel, merchandise, or migrate, trades always happened around them. Maybe they do business by exchange, sometimes they trade using accredited mediums of exchange, the currency. The widest usage of the ancient currency all over the world is shells, so that people called it shell money. Shells are particularly useful as money because they may be strung in long strips of proportionate value or they may be used to provide a single unit value in exchange. Shells ultimately derived their value from their use as jewelry and in rituals. Relative scarcity of the type of shell used or the way the shell is fashioned often determines its value. International commerce in western Asia of the 4th Millennium did not use the medium of money. (Gold and silver coinage came into being in the late 7th century BC). Instead, there was an exchange of different commodities, value being determined by negotiation between merchants. For local transaction of smaller worth, and for the needs of daily life however, the Syrians used shell rings, usually carrying them on a necklace string. Thus these shell rings are a very early true currency. The traditional currency of the Pacific Islands is shell money, beautiful strings of painstakingly carved discs of shell which are strung together to make 'tafuliae'. Each tafuliae has ten strings of colored shells each about 2 meters long, although pieces can be broken off to make lesser payments. The commonest shell as money is money cowrie (*Cypraea moneta*). They are small snail-like creatures that live in the tropical waters of the Indian and Pacific Oceans. Their beautiful shells have been featured in ritual practices and incorporated into clothing and jewelry for thousands of years in African and South Asian cultures. Symbolically they were often associated with notions of womanhood, fertility, birth and wealth. For centuries before European expansion in the 1500's, cowries were also used as a form of currency in some areas - hence the name "money cowry." With the advent of the slave trade to the New World, cowries were among the items that Europeans exchanged with coastal West African groups for slaves. By the early 18th century, hundreds of thousands of pounds of

cowrie shells were being exported from South Asia to Europe, often as "packing peanuts" in the China trade, and then re-exported from Europe to Africa. Evidence for their use in the slave trade comes from Yorktown, an important 18th-century Virginia port, where archaeologists recently found hundreds of cowries in a trash dump dating to about 1760. The dump was on the property of Phillip Lightfoot II, a merchant who was heavily involved in slave importation.



Memento of independence of Palau – with Nautilus and fairy story



Shell money cover with metal (copper or gold)



Ancient money with shell shape – bone material

● Shells and Human’s Religion, Custom, and Education

Many religious behaviors relate to different types of shells. Sometimes Shells could be the ritual instruments used in Buddhist services (Wu, 2003b). Apotheosized forms or meanings of shells could be the object of worship (Hsieh, *et al.*, 2002; Yeh, 2001). Usually we can find many adornments of religion around Buddhist statue, pulvinar, sutra, and temples. For example, in ancient China’s *Wu-Liang Sutra*, “...there are 7 trees with the treasured object for each, the Golden tree, the Silver tree, the Lazurite tree, the Glass tree, the Coral tree, the Agate tree, the Clam tree, Or just 7 treasures. Blend and convert the 7 treasures to be sky and land, to form the world...” In this sentence, the word “clam” means the giant clam. The Hinduism uses *Turbinella pyrum* F. *napus* as the ritual instruments. In Mexico, the aborigine reveres *Lambis scorpius* as god. When Catholic on their way to make pilgrimages, they bring the crucifix made by painted scallops. About 17 years ago, the archaeological excavation in Er-Luan-Bi, Taiwan, found more than 60 relics. After that, this team found 3 stone coffins at the same place. After investigations of three coffins, many rings, bracelets, torques, and necklaces made by shells have been found nearby remains. Another discovery was the unaccounted arrangement of the coffin inside, *Turbo marmoratus* and Tridacnidae had been placed near legs. The “Be-Shen Festival” (ceremony for spirits attached in shells) hold by Tsou (Zou) tribe, Kaohsiung, Taiwan on 2003, the leading roles are 12 spirits in the names of brave, hunt, health, food, off evil, diligence, safe, off lazy, prosperity, tutelar, wisdom, and peace. Spirits attach in various shells in order to stay around the clan all the time (Wu, 2003c).



ritual instrument made with *Turbinella pyrum* F. *napus* in Hinduism



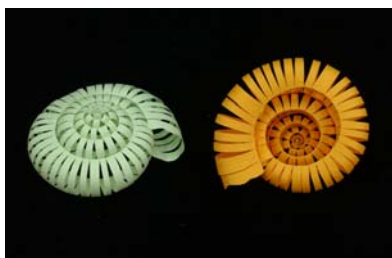
Be-Shen Festival of Tsou tribe, Taiwan



Music album about Be-Shen Festival

● Shells and Human's Leisure Time

There are kinds of shells with two symmetrical pieces. With the white color inner from the crystal of calcium carbonate and variable shapes, people paint on these natural canvases from the ancient times, in order to take down something, express the feelings, or prettify their life. Beside piecing different shells together to make artifact or patterns is also an amazing artistry (Conroy, 1972; Elbert, 1977; Mauries, 1994; Pelosi and Pelosi, 1959; Leeming, 1958). **The Pearl:** pearl is a characteristic product from shells only. One of the important reasons why people like shells so much is the brilliance luster of pearl. The mother-of-pearl can be processed for many purposes, the accessories, ornaments, artifacts, or even the emblem of power. 2000 years ago, Chinese develop the technique to fabricate the Buddhist statue using pearls or polished beads from the mother-of-pearl. After 2000 years today, Japan owns the huge pearl industry. The economic merit of pearl industry holds an important position of the world economy (Bonnefous, 1993; Kunz and Stevenson, 1993; Landman, *et al.*, 2001).



folk art - Paper cutting



Pearl string with polished mother-of-pearl



Handicraft – the Mouse family

Acknowledgment

This project was financially supported by the National Digital Archives Program of National Science Council of Taiwan – **Inventory Studies of Taiwan Fauna: Fishes and Mollusks** (NSC 93-0210-29-E-13-6-2-2-6.2.1)、**Value-added Project of NDAP on “Shell, Humanity, Database”** (NSC 92-2422-H-001-0200) and **Study on E-Shell Map, Digitalization of Molluscan Resources** (NSC 93-2422-H-001-023). Furthermore, we must

thank to the research assistants and graduate students in the Research Center of Biodiversity, Academia Sinica. We must thank to Caliber Multimedia Technology Company, Computing Center of Academia Sinica and the Malacological Society of Taiwan for their publications on the title of *Bulletin of Malacology, Taiwan and Pei-yo*.

References

- Ambrose, S. H. 1998 Chronology of the Later Stone Age and Food Production in East Africa. *Journal of Archaeological Science*, 25(4): 377-392.
- Arakawa, H. 1985 *Raden*. XIV+410. Ton-Peng Publisher, Kyoto, Japan.
- Bonnefous, E. 1993 *Art de la Nacre Coquillages Sacr'es*. 169pp. Mus'ee Qc'eanographique Monaco, Monaco.
- Chang, K. Z. 1946 The shell beads of Atayal tribe of Taiwan in Department of Anthropology, National Taiwan University. *Bulletin of the Department of Anthropology*, 2: 29-35.
- Chang, K. Z. 1958 The origination and dissemination of the culture history of shell beads of aborigines in Taiwan. *Journal of Chinese Nationality*, 2: 53-133.
- Cheng, C. Z. 2002 The relationships between Taiwanese and clans in Indo-China peninsula. cited from <http://www.wufi.org.tw/taiwan/n020729a.htm>
- Conroy, N. M. 1972 *Making Shell Flowers*. 48pp. Sterling Publishing Co., Inc., New York. USA.
- Cox, C. B. and Moore, P. D. 2000 *Biogeography: An Ecological and Evolutionary Approach*. 298pp. 5th Edition, Blackwell Book Company, USA.
- Dance, S. P. 1974 *The Collector's Encyclopedia of Shells*. 288pp. McGraw-Hill Book Company, Great Britain.
- Davidson, A. 1976 *Seafood of South-East Asia*. 366pp. Federal Publication. Singapore.
- d'Errico, Francesco 2003 The invisible frontier. A multiple species model for the origin of behavioral modernity. *Evolutionary Anthropology: Issues, News, and Reviews*, 12(4): 188-202.
- Elbert, V. F. 1977 *Shell Craft*. 288pp. Bobbs-Merrill, Indianapolis, USA.
- Henshilwood, C., *et al.* 2004. Middle Stone Age Shell Beads from South Africa. *Science*, 304: 404.
- Hsieh, C. C.; Wang, C. H. and Lin, Y. T. 2002 *The Society and Culture of Aborigine in Kaohsiung County*. VI+326, Kaohsiung County Government, Kaohsiung, Taiwan.
- Guo, P. Y. 2003 Encounter and Entanglement Between Local and State Currencies: Historical Anthropology of Shell Money in the Solomon Islands. *Forum of Asia Research*, 19: 83-84.

- Kinoshita, N. 2001 Inferring the meaning of shell rings from the comparison of Sheng- Wen Age (繩紋時代) and Mi-Shen Age (彌生時代). *Conference on Purposes of Shells in East Asia at the Ancient Periods*. Institute of History and Philology, Academia Sinica. Taiwan.
- Kuhn, S. L., *et al.* 2001 Ornaments of the earliest Upper Paleolithic: New insights from the Levant. *Proceedings of the National Academy of Sciences*, 98(13): 7641-7646.
- Kunz, G. F. and Stevenson, C.H. 1993 *The Book of Pearl*. XIX+548. Dover Publications, Inc., New York, USA.
- Landman, N. H., *et al.* 2001 *Pearls: A Natural History*. 232pp. Harry N. Abrams, Inc., NY, USA.
- Lee, Y. D. 2001 The Shell Merchandise and Shell Currency – Discussing Purposes of Sea shells at Shang-Zhou dynasty of China. *Conference on Purposes of Shells in East Asia at the Ancient Periods*. Institute of History and Philology, Academia Sinica. Taiwan.
- Leeming, J. 1958 *Fun with Shells*. 92pp. J.B. Lippincott Co., Philadelphia, USA.
- Lian, Z. M. 2001 The shell industry of Taiwan at Prehistory. *Conference on Purposes of Shells in East Asia at the Ancient Periods*. Institute of History and Philology, Academia Sinica. Taiwan.
- Mauries, P. 1994 *Shell Shock*. 112pp. Thames and Hudson Ltd., London, Great Britain.
- Pelosi, F. and Pelosi, M. 1959 *The Book of Shellcraft Instruction*. 80pp. Great Outdoors Publishing Co., Florida, USA.
- Shao, K. T., *et al.*, 2003 Symposium on Phylogeography of the West Pacific. 47pp, National Science Council, Taiwan.
- Tokugawa Art Museum 1999 *The Special Exhibit of Shell Inlay*. XI+146pp, Tokyo, Japan.
- Wang, Y. C., Wu, W. L., and Shan W. 1988 The importance of purple costume in ancient china and it's dyeing from shell. *Processing of the 7th Asia Costume Congress*, 1988: 173-181.
- Watt, J. C. 1968 Grades, clades, phenetics, and phylogeny. *Systematic Zoology*, 17: 350-353.
- Wu, W. L. 2000 Mollusks and Man. *The Pei-Yo*, 26:18-19.
- Wu, W. L. 2003a Humanities Interpretation and Value-added on The Malacofauna Database 2003 *Digital Archives Value Add Conference*, I: p1-13.
- Wu, W. L. 2003b The “Dextral white shell” of the Chain-Lung exhibition in National Palace Museum. *The National Palace Museum Monthly of Chinese Art*, 20(12): 84-87.
- Wu, W. L. 2003c *The Festival of Plum Blossom and Be-Shen*. 63pp. Kaohsiung City, Taiwan.
- Wye, K. R. 1991 *The Encyclopedia of Shells*. 288pp. Chartwell Books, U.S.A.
- Yeh, C. R. 2001 *The Investigation Reports on Custom and Culture of Aborigine in Formosa, V-Tsou*, Institute of Anthropology, Academia Sinica, Taipei, Taiwan.