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Jellyfish in the *Haicuo* Genre: The Evolving Marine Life in Chinese Taxonomic History

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ABSTRACT This article examines the evolving biological knowledge of jellyfish within the *haicuo* (海錯) genre, an early modern Chinese taxonomic tradition of marine life. By situating *haicuo* in a global historical context, it challenges the dominant Eurocentric historiography of biological classification and problematizes the assumption that Chinese taxonomy was unscientific or underdeveloped in comparison to European systematics. The study explores how *haicuo*'s conceptual framework—marked by fluidity, hybridity, and empirical flexibility—contrasts with the rigid, hierarchical order of Linnaean classification. Unlike charismatic marine animals such as whales or dolphins, jellyfish occupy an ambivalent space in both biological inquiry and cultural imagination. As marine invertebrates, they defy conventional categories of animal classification while also resisting human-centered narratives of affection, utility, and conservation. By analyzing historical records, illustrations, and textual descriptions in *haicuo* treatises, this article highlights how pre-modern Chinese thinkers and artists engaged with marine diversity through an alternative logic of classification, one attuned to multispecies entanglements and the dynamic nature of oceanic life. In doing so, it reframes multispecies history as a pluralistic enterprise, encouraging a reassessment of non-Western contributions to biological knowledge and expanding the historical interpretation of the natural world.

KEYWORDS jellyfish • marine biology • multispecies history • Chinese taxonomy • non-Western

1. Introduction

As a historian of biology in modern China, I am particularly interested in the tension between Western-dependent historiography of modern biology and the alternative of crafting an indigenous history of biology with non-Western sources. The incarnation of this tension between modernity vs. tradition, West vs. non-West, and colonial vs. indigenous was manifested in many forms, but the tension was particularly conspicuous in the case of biology, as the term of the discipline only emerged in the late eighteenth century and carries with it a distinctive hallmark of Western modernity.

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The fundamental biological modes of inquiry, from observing, collecting, dissecting, and displaying to experimenting, are sensory and mental capacities derived mostly, if not entirely, from the modern Western knowledge tradition of natural history. In this framework, animals and their importance in Western cultures determine the fate of biological study while marginalizing other categories of living organisms in non-Western knowledge traditions.

To problematize the notions of animal and non-animal living organisms, I recently considered the evolving biological knowledge of jellyfish, which, as marine invertebrates, belong to the “animal kingdom.” But their materiality and cultural perceptions conjured up different sets of meanings and imageries, which separate them from charismatic faunas that elicited affectionate feelings from human beings. Jellyfish, in contrast to whales or dolphins, are uncharismatic due to their stinging capacity; abundant in quantity, which invoked little concerns about habitat loss; and generally unwelcoming as either food items or companion species. In a way, jellyfish, as a venomous species in the ocean, are akin to that unpopular kid in a classroom. But jellyfish are never just one species. What we call “jellyfish” (or colloquially as just “jelly”) is a rubric that groups together many different species of different taxonomic ranks. As the author of an authoritative text on the natural history of jellyfish recently notes, “many people are still not sure what, exactly, jellyfish are.” (Gershwin 2016, 7) Part of the reason is that the world of jellyfish, like that of other marine invertebrates, is a multispecies assemblage of its own. Nor is jellyfish an oceanic creature only. The case of jellyfish—seemingly one type of marine invertebrate that humans loathe—uncovers more diversity and otherworldliness than hitherto has been recognized or appreciated by human actors (Luk 2024). Jellyfish scientists and artists have come up with tools to unravel and display the mysterious but splendid world of the jellyfish. As historians, what toolkits do we possess if we want to tell a more complex but fascinating story of the multi-species history of jellyfish?

In a recently published volume titled *Maritime Animals* (Nagai 2023), several contributors acknowledge the methodological challenges imposed by the limitation of sources in conveying multispecies experience. As much as historians want to give full voice to the agency of animals (and nature) in history, a large part of their perspectives and experiences were inevitably lost in human-generated and -preserved accounts of the past, which were mostly anthropocentric. Creative ways of reading and interpreting historical records are proposed and adopted, as well as humbly admitting our “embodied identities as humans and the human origins of almost all of our source materials” and opting for an animal-sensitive history instead of attempting an out-of-reach animal-centric history (Cushing 2023). As a whole, the volume is a joint effort to bring in the missing roles and voices of maritime animals in the age of European navigation. The objective is to question the entrenched anthropocentrism in narrating the maritime age of the eighteenth and nineteenth century. As impressive as some of the accounts were, the Eurocentrism of maritime history was left untouched. Despite some of the postcolonial critiques contained in several chapters, how to write a multispecies history of marine animals from a non-Western and non-human perspective remains unexplored.

In this essay, I ask: How does one historicize the vast array of marine life beneath the sea during the maritime age of the eighteenth and nineteenth century without essentializing the European knowledge systems of ordering nature? This question is hardly new or inventive on its own. Historians of science in modern China would immediately recognize my question as merely another incarnation of much older debates between what Benjamin Elman called “Universal Science” versus “Chinese Science” (Elman 2003). Outside of China studies, historians of science problematize the notion of “ordering nature” and urge scholars to pay attention to the circulation of specimens and artifacts. Emphasizing the global exchange of material objects and cultural encounters is a fruitful means to bypass the endemic Eurocentrism in approaching the history of natural history. The circulation-inspired, knowledge-in-transit mode of inquiry enhances our understanding of the practice of science in history. Although there is a chance that power asymmetry is obscured when an undue emphasis is placed on the seemingly obstructed flow of knowledge, I intend to apply the concept of circulation to critically understand the “variegated stuff from the sea” in the Chinese taxonomic tradition of *haicuo* (海錯). The eighteenth-century genre of *haicuo* is roughly equivalent to what we now call “marine biology” today. In the case of *haicuo*, the concept of circulation is more than just a metaphor, but carries a built-in notion of fluid forms of marine life in different zones or regions. In the rest of this paper, I present the case of jellyfish from the *haicuo* taxonomic tradition while placing my analysis in a global context.

2. Jellyfish in the *Haicuo* Genre

Haicuo is a pre-modern Chinese biological term that encapsulates a wealth of multi-hued, multi-formed, multi-layered living organisms in the sea. *Haicuo* is the shorthand of the phrase “*haiwu weicuo*” (海物惟錯), which means the multifarious or variegated nature of sea products. Originally derived from the “Books of Documents” in which certain rare seafood was recorded as imperial tribute, now it is an archaic term largely replaced by *haixian*, that is, seafood. Some contemporary writers suggest that the concepts of *haicuo* and *haixian* are largely interchangeable (Yang and Sun 2012). Yet, the heterogeneity and circularity of marine life, which was vividly captured in the premodern character *cuo*, are lost in the modern insistence on freshness (*xian*). As such, the notion of *haicuo* retains the livelier and more dynamic nature of marine life stuff than the mainstream idea of seafood or marine biology allows.

Jellyfish was featured in a Qing-era treatise called *Haicuo Tu* (Pictorial of Marine Creatures 海錯圖). This eighteenth-century text collated more than one hundred and ninety-three known marine organisms in four volumes.¹ Jellyfish were the subject of the chapter named “Ode to Jellyfish” (蛇魚贊). Although the common Chinese name of jellyfish is “*shuimu*” (literally “aquatic mother”), an array of other names were also assigned to different types of jellies, such as 海蜇 (sea bug), 魷魚 (sea torpor), 蛇 (fish), 蟄 (bug), and 石鏡 (stone mirror). The string of jellyfish-related Chinese

¹The earliest date of *Haicuo Tu* was estimated to be 1667, the year when the author named Nie Huang started composing and illustrating the treatise. It was compiled into four volumes and stored in the Forbidden Palace in 1726 during the Yongzheng reign. For more, see Yang and Xu 2021.

names was explained as follows, “*Zha* is the same as fen, fish, jellyfish, shrimp-fish, sea leather, sea tongue, river bug, sea bug, bug’s skin, stone mirror, chupu fish.” (Yang and Sun 2012, 3) The diversity of names assigned to jellyfish indicated a prominent Chinese interest in this gelatinous marine life, which enjoyed the distinction of being one of the oldest marine creatures consumed by the coastal people in China’s southern seaboard. Several medieval Chinese texts described the names, recipes, color, and texture of jellyfish, but what distinguished the narratives in *Haicuo Tu* from the earlier historical depiction of jelly is the topic of species transmutation. The heterogeneous forms of life in the ocean offer the possibility of one creature transforming into another (海錯中諸物之能變者証之). In “Ode to Jellyfish,” the author Nie Huang questioned the alleged “transformation of jellyfish into a seagull” (蛇魚化鷗) (Yang and Xu 2021, 444).² Nie did not accept the alleged transformation as proof of the easy transformability from one species into another, urging:

until we have used other examples of marine creatures that can transform to prove, such as maple leaves transformed into fish, rotten grass into flies, tiger sharks into tigers, deer fish into deers, yellow buntings into fish, cuttlefish into cuttle, croakers into birds, under the principle of change, just as locusts turned into shrimps, shells into crabs, then I shall be led to believe that jellyfish could transform into a seagull (Wen and Palace Museum 2014, 78).³

Nie subscribed to the idea that jellyfish belong to the “aquatic insect” type while seagulls belong to the “avian” type. He thought it was highly unlikely that the claim that jellyfish could transform into a seagull could be verified with proof. Although Nie expressed skepticism about the transformation of jellyfish into a seagull, he was willing to accept the principle of change and the permeable boundary between species. Contemplating over the theoretical and practical implications of species change, Nie regarded tales of radical change—as in the case of jellyfish trans-morphing into a seagull—with a healthy dose of circumspection. The string of examples from leaves-into-fish, croakers-into-birds, locusts-into-shrimps highlights the relationality and transformation of all life forms in his mind, from plants to insects to large animals.

In particular, the scenario of “jellyfish transforming into a seagull” points to a biological classification different from the Linnaean system. In traditional Chinese taxonomy, living beings were organized based on modes of reproduction (viviparous, oviparous, moisture-born, and spontaneously generated) or external characteristics (feathered, furred, scaled, shelled, and soft-bodied). These systems reflected a cosmological and hierarchical understanding of life rather than an evolutionary one (Guo 1999). Within this context, species transmutation—a precursor to evolutionary thought—was

²The contributor-editors of this volume are scientists by training and they are quick to reject the scientific veracity of species transmutation theory as “此皆化生說之謬” without unpacking the historical richness of the *huasheng* tradition. The tendency to dismiss premodern Chinese biological theories prior to the introduction of modern Western biology to China is not limited to scientists alone. Some Chinese historians of biology who have offered interesting analyses of the *huasheng* tradition also shared a similar historiographical attitude. See Zhao 1995.

³The original text is 「海錯中諸物之能變者証之,如楓葉化魚,已等腐草之為螢,若虎鯨化虎,鹿魚化鹿,黃雀化魚,烏賊化鳥,石首化鳧,原有變化之理,合之蝗之為蝦,螺之為蟹,則信乎蛇能變鷗」

not framed in terms of common descent but rather transformation across categories. The idea of “*huasheng*” (化生) suggested that certain organisms could arise from non-living matter or change their forms under specific conditions, aligning with pre-modern notions of metamorphosis and elemental influences. For instance, classical Chinese texts sometimes described fish turning into birds or insects emerging from decayed matter, reflecting a fluid boundary between life forms.

The Chinese notion of *huasheng* differs fundamentally from Darwinian evolution, which is based on gradual change through natural selection. However, one might argue that the idea of hierarchical superiority in “胎生貴於卵生” (viviparous beings are superior to oviparous ones) hints at a ranking of biological complexity, which could, in some ways, be mapped onto later evolutionary thinking. While it does not imply a lineage of descent, it suggests a gradation of vitality, which shaped Chinese interpretations of living beings. A modern reader of science will likely regard the claim of “jellyfish trans-morphing into seagull” as mere speculation. Yet this speculative claim relates to multi-species relationality in pre-Darwinian time and space. It opens up the realm to consider an alternative history of evolutionary thinking from the non-Western narrative of species transmutation. As James Poskett recently asserts, “to properly understand the history of evolution, we need to recognize that, before Darwin had even boarded *HMS Beagle*, people were already discussing the possibility that species might undergo transformation.” (Poskett 2022, 180) Before the coming-of-age of Charles Darwin and other prominent Western naturalists, the relationship among species was a topic of metaphysical rumination in different parts of the world. Drawing from recent research by G. Clinton Godart, Poskett referenced a Kyoto-based Japanese philosopher named Kamada Ryūō and his theory of evolution. In Kamada’s 1815 neo-Confucianist-cum-Zen-Buddhist text *Rigaku hiketsu*, he speculated how “one species of plant changes and becomes the manifold of plants” and that “one species of animal, insect, fish, changes and becomes the manifold of animals, insects, and fish.” (Godart 2017, 19) Kamada’s multi-layered relationality of plant-insect-animal-fish transformation was reminiscent of Nie’s contemplation of “jellyfish trans-morphing into a seagull.” Juxtaposing these two East Asian naturalist-writers of the late eighteenth and early nineteenth centuries allows us to draw a pre-Darwinian picture of evolutionary order.

3. Conclusion

Before the ascendancy of Darwin, several eighteenth-century naturalists, including Darwin’s grandfather had offered various models to theorize the evolutionary patterns of organic and inorganic matters. The Western history of evolutionary thoughts and reception has been subject of the many excellent books by Peter Bowler (1998, (1983) 2008, 2013, 2021, 2024). Part of the revolutionary aspects of Darwinism is the idea that species are artificial—they don’t really exist in nature. Rather, “species” are created by naturalists trying to order the world. But since species are constantly evolving, all that naturalists can do is take a snapshot of the world as it is and try to freeze what can’t be frozen just so they can study it. Darwin makes it possible to question the conceptual foundation of species, which led to the modern scholarly debate on what constitutes “species.” The popular view of species as a reproductive isolation

concept is just one of the twenty-five or more species concepts currently offered by scientists. Aside from this generative concept of species, there was also the genetic concept of species by which a species is defined as “identifiable genotypic clusters”; the evolutionary species as “a lineage (an ancestral-descendant sequence of populations) evolving separately from others and with its own unitary evolutionary role and tendencies”; the phylogenetic species which can be further divided into the Hennigian species concept, the synapomorphic species concept, and the autapomorphic species concept. Adding to the list are discipline-specific conceptions of species as in ecology and paleontology (Wilkins 2009).

While *haicuo* and *huasheng* are Chinese terms for multi-(marine) species and species change, respectively, by foregrounding these concepts in the history of biological classification, this essay prompts us to rethink narratives that cast Chinese taxonomy as underdeveloped or unscientific in comparison to European systematics. Instead, it highlights a different logic—one that is attuned to fluidity, hybridity, and empirical flexibility. This reappraisal urges us to reconsider taxonomic traditions outside the framework of Linnaean classification, revealing a more pluralistic history of natural knowledge. In conclusion, *haicuo* represents an alternative mode of organizing biological knowledge, one deeply embedded in Chinese intellectual and artistic traditions. Recognizing this framework allows for a richer understanding of classification practices beyond Eurocentric models, emphasizing the historical diversity of how humans have sought to order the natural world.

Disclosure Statement

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