

人們通常所說的“珊瑚”是一種共生實體的死亡部分，它是一種動物（珊瑚蟲 Polyp）和藻類（共生藻 Zooxanthella）的組合。白色固體骨骼是由珊瑚蟲產生。但是在更廣的層次上，珊瑚形成了無法估量的生命形式的整個棲息地。而那些人們收集來販售給遊客的，頗為吸引人的白色碎塊，正是珊瑚死亡時剩下的部份。

What people usually call "coral" is the dead part of a symbiotic entity which is the combination of an animal (Polyp) and an algae (Zooxanthella). The white solid skeleton has been produced by the polyp. But at a larger level, corals form a whole habitat for immeasurable number of lifeforms. The white debris we find sometimes on the beaches, the attractive structures that were collected and sold to tourists is only what remains when the coral is dying.

拿一架鋼琴，用緊握的拳頭輕輕敲擊鍵盤，音符表現為“音簇”，像是一個不知名的聲音星座。它們正在挑戰我們的聽力慣性，沒有已知的地圖可以用來欣賞這些音樂配置，聽的人必須自行去描製它。

Jakob Von Uexküll 所提出的 Umwelt，是動物自身所感知到的世界。海膽，魚或浮游動物的生物懸浮體，都有不同的感知器官和認知過程，並且它們都各自具有再現其周圍物理世界的不同方式。不同物種間的 Umwelt 有時是相互作用，或相互交疊的。

那麼，我們是否可以稱珊瑚礁環境，為某種“Umwelt 簇”呢？

Take a piano. Gently strike the keyboard with your clenched fists. The notes appear as a cluster, an uncharted constellation of sounds. They are challenging our listening habit, there is no map known to appreciate their musical configuration, the listener has to draw it.

Umwelt as proposed by Jakob Von Uexküll are the perceived worlds in which animals live. A sea urchin, a fish or a living particle of zooplankton, all have different perception organs and cognition processes and they have different representations of the physical the world that surrounds them. The Umwelt of different animal species are sometimes interacting or overlapping.

Can we call a coral reef a "Cluster of Umwelt" ?

在澎湖群島上，數百年來，這裡的人們建造珊瑚屋為居_依照祖先的居住地_閩南建築的形制而建，稱為“咾咕厝”。他們會潛入岸邊水下，費力找拾珊瑚塊，將數量驚人的塊狀珊瑚堆放在岸上，經歷長時間日曬雨淋後，把其中的一部份加以裁切，另一大部份則保留原樣。珊瑚骨架的微觀結構包含很多細小孔隙，使其成為建築和隔熱保暖的地區性理想建材。但許多咾咕厝的繼承者因居住人數增加和時代轉變，或難以全住在一起而改建，或常因同一房產的所有權人數太多而導致轉售問題，於是許多老屋被遺棄。

植物在這些“咾咕厝”的庭院裡快速生長，樹木破壞了牆垣和屋頂，就像一個牡蠣外殼被人硬生生撬開。

In Penghu archipelago, in the last centuries, people were building coral houses. They would dive and pick up blocks of coral, let them dry on the shores, cut them in the shape of bricks. The microstructure of the coral skeleton contains a lot of tiny empty spaces, making it an ideal material for construction and insulation. Too many to inhabit these traditional houses, too many to agree to sell them, the heirs simply abandon the remaining ones.

Quickly, plants grow inside the courtyard, trees break the roof and the house like one would open an oyster.

潮汐下降，露出了珊瑚枝狀的尖端，與一座被淹沒的城市屋頂不無相似處。附近村莊的居民穿行過礁石之間的路徑，梭巡和挑選即將成為他們食物的動物，並小心不被逐漸回升的潮水所捕獲。

漲落潮之間的物理空間和時間間隔，使人類得以輕易進入海洋動物的世界。在上一個世紀末，這幸運曾被大眾旅遊所摧殘...這種無知的商業活動有些甚至鼓勵遊客動手折斷珊瑚的一部分，或隨意踩踏它們，最後常會導致一個區域生態系的毀滅，在島嶼之間，形成大片受傷的棕灰地帶。

The tide goes down, revealing the tip of coral branches, not unlike the roofs of a submerged city.

Inhabitants of the villages nearby would travel through paths among the reef, picking animals which will become their food, being careful of not being caught by the rise of the tide.

Physical spaces and time durations between the tides allow humans to easily enter the worlds of marine animals.

At the end of the last century, this opportunity was destroyed by mass tourism. The business of ignorance encouraged visitors to break parts of corals, step on them, and eventually destroying this ecosystem, creating large brownish areas between islands.

在春季，如果你到倖存的珊瑚礁水域裡游泳，你可能有機會沉浸在含有珊瑚蟲精液的水中...不過，其實你只能聞到它的氣息或味道：在充滿了浮游生物的海水中漂浮著，被海洋生物的幼體所包圍，於有機懸浮物所形成的雲霧中。

在人體內，細菌的數量比人類的細胞高了十倍有餘。我們身體的百分之九十是非人類的。我們也是一種共生實體_各種生命形態的殖民地，基於此，我們其實與珊瑚共享同一身份。

Swimming down into the remaining reefs, in Spring, one might be immersed in the semen of coral polyps, only perceptible by its smell or taste. Floating in a sea of plankton, surrounded by the spawn of marine life, among clouds of organic particles.

In a human body there are ten times more bacteria than human cells. Ninety percent of our body is non-human. We are symbiotic entities, colonies of lifeforms and we share this status with the coral.

如果珊瑚蟲自己不會產生聲音，那麼作為棲息地的珊瑚礁則會產生無數的聲音。主要組成之一是槍蝦——這種甲殼類動物發出響亮的咔嗒聲來擊暈牠們的獵物。一些魚也會噉、敲擊、鳴叫或呼嚕，用以保衛自己、要求領土或吸引交配伴侶。一些其他魚類用牙齒咬碎珊瑚來餵養自己。海膽的棘刺在礁岩上移動磨擦，軟體動物刮食著藻類。在進行光合作用時，一些海草會產生微小的氣泡。所有這些微小聲音，形成了一個充滿聲響的環境，而我們幾乎聽不到，因為人類耳朵在水中的效率十分低下。但是珊瑚的聲音被它的一些住客所聆聽：如果一隻動物可以用聲音進行溝通，那也表示它可以聽到其他聲音。在廣大海域游泳的不同動物的幼體（也是浮游生物的一部分）將根據這種聲音動態來檢測這些聲音，並選擇牠們的生活棲地。健康珊瑚的聲音是意味著生命力、安全的住所、食物來源的保證。

If the polyps of corals don't produce sound, the coral as a habitat creates a myriad of sounds. One of the main component is produced by snapping shrimps, crustaceans which emit loud clicking sounds to stun their prey. Some fishes are also chirping, knocking, groaning or purring in order to defend themselves, claim a territory or attract a mating partner. Some other fish species feed on coral, crushing it with their teeth. Sea urchins rub their spikes on the rocks and molluscs scrap algae. Some sea weeds produce little bubbles when doing photosynthesis. All these tiny particles of sounds, that we can barely hear because of the inefficiency of human ears in the water, make a sonorous environment. But the sound of corals is being listened by some of its habitants : if an animal can communicate with sound, it can often hear the other sounds. Larvae of different animals (part of the plankton) swimming in open sea would detect those sounds and chose their living habitat according to this sonic animation. The sound of healthy coral is a sign of life, of a safe shelter, promise of food.

2008年冬季，由於全球氣候變化，一道冷流從北向南穿越澎湖群島，降低了水溫，造成了這珊瑚環境大部分的死亡。特別是在2009年發生的全球珊瑚白化，也影響了這一地區。而晚近成立的“南方四島海洋國家公園”，使得島嶼間的過度捕撈問題得以開始被正視。但是全球海洋生態系統的普遍情形令人感到憂心，珊瑚礁生態更是受到威脅，還有一些非常緊急的狀況，例如澳大利亞的大堡礁。

此聲音裝置主要來自於2017年4月和5月期間，以水中麥克風在澎湖群島進行的水下錄音，錄音的幾個地點如下：師公ㄅㄚˊ，鎖港，井垵，目斗嶼，七美島，東吉嶼。

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In Winter 2008, caused by global climate change, a cold water stream crossed Penghu archipelago from the North to the South, decreasing the temperature of the water and killing the largest part of coral environments. The bleaching of corals happening especially in 2009 also affected this area. "South Penghu Marine National Park" was recently established in order to spare a part of the archipelago from overfishing. But the general health of the marine ecosystems in the whole world is worrying, coral reefs being especially under threat, with some alerting conditions such as the Great Barrier in Australia.

This sound installation is based on underwater recordings (made with hydrophone) realised in April and May 2017 in Penghu archipelago, at the following locations : Sai Gong Da (Black Islet in the Inner Sea), Suogang, Jingan, Mudou Island, Qimei Island, Dongji Island.

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生命是一個信號交換過程。

珊瑚蟲進行與共生藻的內部對話。他們透過化學作用進行交流，以保持互利共生。但珊瑚也與其他生命形式溝通：發散化學信息，展示顏色和熒光，以吸引蝦或魚等住客，邀請牠們進行清潔工作，以及吃掉一些對珊瑚而言具有威脅性的藻類。在牠們附近，許多動物正在展示視覺信號，例如近來頗受到人類孩子喜愛的小丑魚顏色，或者一些不那麼知名的雀鯛，正游動著，進行牠們的求偶舞。珊瑚礁海域是一個生動無比的信息織錦，一個充滿互動性和詮釋性的整體網絡。

Life is a sign exchange process. The Polyps of corals are engaged into an inner dialogue with the Zooxanthellae. They exchange through chemicals in order to preserve their mutual benefits. But corals are also communicating with other lifeforms. Releasing chemical informations, exhibiting colours and fluorescence to attract hosts such as shrimps, fishes, to invite them to eat some unwanted algae. Nearby, numerous animals are exhibiting visual signals, such as the colours of the Clownfish who recently became a favourite among human children, or some less known Damselfishes which perform courtship dances. The coral reef is a vivid tapestry of informations, a whole network of interactions and interpretations.