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## *'A Web of Connections Binding us to Others', Bats, Birds, Squirrels, and Guano*

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Bats are numerous in the world: as of today scientists have identified and classified around 1,400 sp. (*Handbook of the Mammals of the World*, 2019, Vol. 9. Bats. Lynx Edicions, Barcelona, 1008 pp., 74 color plates, 404 color photographs, 1422 distribution maps.). Since the COVID 19 pandemic burst, many quests and queries focus on bats as pathogenic agents potentially involved in several zoonosis. The extensively documented article “*Sources of Ambivalence, Contagion, and Sympathy: Bats and What They Tell Anthropology*” by Professor Frederic Laugrand assisted by Antoine Laugrand, PhD student and Lionel Simon, Postdoctoral fellow, FNRS-IACCHOS-UCL, illustrates the many ways to consider these mammals ranging from negative to positive perceptions often opposing urban cultures / traditional local groups in Southeast Asia but with a prevailing auspicious value in China where Bat, *Biǎn fú*, is a mythological symbol between earth and sky. It conveys also the notion of happiness *Xin fú*. In the verticality of the world, a T-shaped funeral procession banner painted on silk with black ink and colors, depicts in three parts, the heaven, the human realm in the middle space, and the chaotic infra-world. On the upper part of the middle realm, a bat with its opened wings holds up the heaven. This motif also appears on embroidered imperial robes<sup>1</sup>,

The article aims to help the reader to shift his frame of reference and to learn from other perceptions, attitudes and uses within many other ontological frames provided by numerous ethnographic examples in the Americas, then in Northern Asia and Southeast Asia. By a compilation of many examples worldwide the authors show how the traditional local conceptions referred to are quite distinct from many doxa.

One of the most striking example is found among aboriginal Australians of Victoria River, where a family is composed of humans and flying foxes. The mothers are thought to be since the time of creation flying foxes and this has an implication on the social organization, particularly on the affinity rules. The connectionist thinking here provides a rule of prohibition, namely, flying foxes people do not marry other flying foxes people, the rule of exogamy is stipulated.

This ancestral cosmology, reactivates by way of myths and kinship a rather recent debate (1986-1991) referred to in Laugrand' paper (: ???), about the phylogeny of flying foxes, some authors suggesting from neurological characters that they were more closely related to primates than to microbats (Pettigrew, J. D. (1986). Flying primates? Megabats have the advanced pathway from eye to midbrain. *Science*, 231(4743), 1304-1306).

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<sup>1</sup>. Danielle Eliseeff, 2003 : *Art et archéologie : La Chine du Néolithique à la fin des cinq Dynasties (950 de notre ère)*, École du Louvre, rmn, pp.199-203 Notice 43: Tomb n°1 of Mawangdui, Western Han period (206 BC – 25 AD) This banner was found in 1972 draped over the coffin in the grave of Lady Dai (c. 168 BC) next to the the tomb of her husband and their son, at Mawangdui, near Changsha, Hunan province.

Since molecular biology has discovered DNA, scientists have been able to trace the phylogenetic relationships between groups using genetic information. Based on genetic characteristics, several authors brought clear lines of evidence showing that microbats and flying foxes form a monophyletic group (Nikaido, M., Harada, M., Cao, Y., Hasegawa, M., & Okada, N. (2000). Monophyletic origin of the order Chiroptera and its phylogenetic position among Mammalia, as inferred from the complete sequence of the mitochondrial DNA of a Japanese megabat, the Ryukyu flying fox (*Pteropus dasymallus*). *Journal of Molecular Evolution*, 51(4): 318-328). Flying foxes are not primates! Neurological resemblance between Primates and flying foxes results from a convergence and does not derive from a common ancestor.

With the authors, I share the proposal of transforming our split view on the components of nature - related also to the split of our disciplines - and emphasize the connectedness between Humans and all living things in the phenomenal world they inhabit. This attempt aims to transform our attitude of fear and rejection to a more comprehensive, holistic view of the Living.

Thanks to the fieldwork of anthropologists and naturalists, we do start to benefit from local traditional knowledge based on empirical observations, uses and skills according to the meaning proposed by Tim Ingold : '*skills being properties of the whole system of relations constituted by the presence of the agent in a richly structured environment*'. I would like to emphasize that the *mycological model of continuity among individuals (fungi) is thought to be more suitable than the zoological model of discrete individuals (animals)*. (T. Ingold, 2004, «Two Reflections on Ecological Model », *Nature Knowledge. Ethnoscience, Cognition and Utility*, Gl. Sanga & G.Orthalli (eds.) Berghahn Books, : 301-311).

In order to do so, I shall add a brief survey on five species of bats, three species of swiftlets, and one squirrel as they share either the same habitat (caves) or the same food (insects, fruits), and bats and swiftlets are producing guano with their excrement. They are present in caves along the west coast, in the spectacular karstic formations, in El Nido at the northern tip and further south, in the famous archeological site of Tabon Cave, Lipuun Point, as well as the Ransang area, and the Singnapan Valley, while swiftlets nest on cliffs, falling abruptly into the South China Sea.

Being an anthropologist in insular SEA, and particularly in the Philippines, I shall complement the given documentation and I propose to add, some local uses I was able to gather during many fieldworks conducted from 1970 up to 2018 in collaboration with the Pala'wan living in the southern part of the island by the same name.

My field research is based on a long commitment with faithful returns, a deep attention to micro-details and a thorough collaboration with the local people (fathers, mothers and children) in the fluidity of life following the examples Georges Condominas and Harold C. Conklin, 'mes Maîtres'. Then the work developed in Paris and the precious long collaboration with naturalists and taxonomists at the MNHN in order to know *what is what* and be able to describe, understand and translate a local traditional knowledge.

The concatenation between all living things briefly alluded to in this comment about local traditional peoples' lifeways - exemplified by the Pala'wan - reveals also another way to grasp and bring together the components of the world. Through the years, they transmitted me their knowledge and the intellectual awakening we can all benefit from.

Pala'wan Practical Engagement with the Environment and Traditional Conceptions  
Humans - Bats - Birds - Squirrels and Guano

Daily, after sunset, looking towards the south, we were seeing waves of *kabäg* as they were passing high in the sky over our house, on a small island on South China Sea. They were taking off the Tabon caves complex, Lipuun Point, toward the north, on their route to the main island where fragrant fruits were attracting them.

*Kabäg*, (*Megachiroptera*, two very large species are found in Palawan *Acerodon jubatus* and *Pteropus amplexicaudatus*), a large size flying fox eating the fruits of *Binuwaq* (*Magkaranga tamarius*, Euphorbiaceae). / *ngik - ngik - ngik* / are the ‘sounds-words’ emitted. Coming out of caves at dusk and night time, the *Taw ät batu* or the Pala’wan living in seasonal variations in rock shelters and the mouth of caves in the Singnapan Valley - far from being frightened, do live in their very presence and consider them a delicious food. After locating them with torches in the depth of caves, they take position on their trajectories out of the cave in order to capture them with rattan thorns *läwläw* on top of bamboo poles. Toasted on embers with their fur, they are eaten on the spot: “*Their flesh tastes like balud green imperial pigeon (Ducula aenea palawanensis* Columbidae), and is fatter”.

All flying foxes are *Megachiropters* finding their way by sight and smell. Contrary to *Microchiropters*, they do not rely upon echolocation (sonar) to ‘see’ in the night except the genus *Rousettus* which uses ‘primitive’ lingual echolocation to move in the complete darkness of caves where they roost. .

*Ämämkung* (*Megachiroptera*), cling on rocks and make clicks: /*tsit - tsit - tsit* /. Along the year, they eat the fruit of *tirungän*, a tree bearing fruits without flowering. To capture them the same bamboo poles with rattan thorns are used to beat them as they fly. Their flesh is highly appreciated too.

*Ämbalang* (*Megachiropters* of small to medium size, three genera are found in Palawan), have a tiny body and live in stones as well.

Their word-sound is : /*ting - ting - ting*/ they are eating the fruits of *tirungän* and are present all year long. They are captured with the same tool *läwläw ät ämagas*, in order to be eaten.

Inland :

- *Patukiq* (*Microchiroptera*), a very tiny bat eating ants, *säräm* and *urnäw*, living in bamboo, *sumbiling*, (*Schizostrachyum lumanpao*), like the Palawan black shama, *bilad*.

It speaks by way of clicks: /*Ts - Ts - Ts*/, /*Rit - Rit -Rit*/ . People consider it as a bird, *bägit*, and it is a food too. After being captured by cutting the bamboo internodes that are burnt, *patukiq* bats are then boiled to be eaten. This species is probably *Tylonycteris pachypus* which roosts in the hollowed internodes of bamboos.

- *Käläläpnit* (*Microchiroptera*), has also a tiny black body with little rounded eyes as a human child. They have no nest, but hangs from the branches of a tree, head down, eating insects (ants, etc). It is captured with the same type of pole with rattan thorns at the distal extremity, *läpsan ät läwläw ät ämagas*. They do not have a specific word-sound.

I like to refer to an “imagined reality”, *Maruy*, the Bats’ ancestor, and complement F. Laugrand quotation. Enormous, with two teeth longer, it provokes death by sucking and is assimilated to a vampire. *Maruy* hangs from trees, head down like a flying fox, and is part of a long list of Malevolents, *Taw Märaqat*, causing many diseases (N. Revel, 1991,

« La nourriture des invisibles ou l'Homme pris » in *Histoire Naturelle Palawan* Ch. 2 ,vol. II, *La maîtrise d'un savoir et l'art d'une relation*: 79 124). This is why when it enters home, it is an ill-omened sign, *ngasa*.

I notice several similarities with the Alangan' perceptions, imagined realities and food practices in central Mindoro as well as the Ayta, a Negrito group, referred to by F. Laugrand & al.

In Laos, Vietnam and Yunnan, *Rhinolophus affinis* with its horseshoe shaped nose is present. This insectivorous species is considered a reservoir of Corona viruses related to the SARS-CoV-2 involved in the Covid-19 pandemia.

In Palawan, there are at least seven *Rhinolophus* species (Esselstyn, J. A., Widmann, P., & Heaney, L. R. (2004). The mammals of Palawan island, Philippines. *Proceedings of the Biological Society of Washington*, 117(3) : 271-302) close to *Rhinolophus affinis* that are potential reservoirs of coronaviruses. The *Tau't Batu Studies* Jesus T. Peralta ed., Monograph N°7, National Museum, Manila 1983 lists seven species of bats in the Singnapan Valley, but do not give the vernacular terms (chapter III, p. 43). Some scientific names are different (1978) because of taxonomic changes but compatible with the names given by Esselstyn (2004) <sup>2</sup>

Apparently bats are not perceived as such a dangerous disease carrier by the upland people, nor the Pala'wan living in caves in Singnapan Valley during the rainy season. Both enjoy catching them and eating them. They rather have a friendly relationship and perceive flying foxes and the other bats as good food providers, for they appreciate their flesh and even consider them a food which gives strength. This shows the pragmatism of forest people as predators in quest for all kind of food.

With a more holistic view, let us focus now on birds sharing their habitat with bats: *lampitagus* and *lampisayaw* (2 swiftlet species belonging to the genus *Collocalia* and/or *Aerodramus*). These swiftlets are eating insects and their nests of mosses and saliva are attached on rocks cavities, caves and cliffs, along the year. In the same way, *ämämänpang ät Duruy* (*Hirundo rustica*) and *ämämänpang ät Buntäl* (*Hirundo tahitica*) are present the whole year too, but these two swallow species (Hirundinidae) fly only during the Monsoon of the Chick *Duruy* (Gemini), in august, and the Monsoon of the Globe fish *Buntäl*, (Southern Cross), from september up to december. They are perceived has having a companionship, *mägiba-iba*, with bats.

The very valuable *sarang* live close to *lampitagus*, either on cliffs by the sea, or upland. The golden nests of swiftlets (salanganes in french) are perceived as the sap of *Lagundiq* (*Vitex sp.*), an invisible tree, the primeval tree created by *Nägsalad*, the Weaver. When cooked this nest made of saliva blows and is considered by the people as a remedy, providing long life and good breathing capacity. *Sarang* were not hunted, nor eaten by the Palawan I met, however they say their ancestors were trading these nests with rich chinese merchants. Today this hazardous catch is collected and traded in the area of el Nido, perhaps by the Tagbanuwa.

Let us consider now *Tapilak*, the flying squirrels (*Hylopetes nigripes*, Sciuridae), distinct by shape and fur color, have quite opposite habits from *kating*, the trees' red squirrel with a long tail, (*Callosciurus sp.* Sciuridae). Making their nests in the trunk of trees where 5 even 10 can live, sleeping in daytime, but flying/gliding at night time thanks to their lateral

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<sup>2</sup> If we compare the two listings, according to UICN, one specie is not present in Palawan *Eonycteris robusta*- Dawn Bat .

membranes *panig*, eating the same fruits on *tägubang*, *katäl*, *tirungän*, *baringin* trees as flying fox bats (but also bark of various trees and vines), feeding the young with their milk, they are also perceived by the Pala'wan as 'companions' of bats, *mägiba*.

This is not an "imagined reality" but an empirical observation of hunters and foragers in the constant process of developing a traditional local knowledge as agents in the living world that is theirs.

Let us focus on both bats and swiftlets as they share the same habitat and their excrements turn into guano. This valuable product was collected by Indigenous Peruvians on islands off shore and used in Europe as a fertilizer for agriculture during the 19<sup>th</sup> century. We are not aware of this use among the Pala'wan, while the Ayta referred to by F. Laugrand do make use of it.

In fact, the process of collecting guano is a delicate action as fungal spores can be liberated and enter the respiratory tract by inhalation, provoking a lung disease known to scientists as "histoplasmosis."

#### Guano:

There are several types of guano in caves: fresh guano and historical guano, which loses its volume and turns compact with time. In the Tabon caves complex of Lipuun Point on the Western coast of Palawan, we could observe that another bird comes in, an incubator bird, *puligi* (*Megapodius freycinet*. *Megapodiidae*). By laying its eggs in the guano, it disturbs and turns chaotic the levels. For pre-historians, stratigraphy is totally altered. Then the work by a geologist, previous to excavation has been necessary as there are dissonances between the mineralogical alterations. Then time analysis turns quite complex.

In the famous pre-historical site of Tabon Cave, an investigation similar to a detective's work, had to be conducted with mask to avoid the spores of fungi attacking the lungs-The diggings on 750cms of guano in various parts and dating by Carbon 14 allowed to reach up to 38,000 years ago (PREHSEA Excavations 2012-2016, Omar Choa, *A Geochemical History of Tabon Cave*, Phd, MNHN, Paris, 2018)<sup>[3]</sup>

When Tabon was discovered in the sixties, we never heard of local communities nor native co-workers taking part in the successive excavations conducted by Dr. Robert Bradford Fox, being aware of this danger.

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A Chinaware cup with bats motif

Époque of Qianlong (1736-1796)

<https://www.rm-auctions.com/fr/arts-dasie-avril-19/14197-une-coupe-en-porcelaine-de-chine-a-decor-de-chauve-souris-marque-et-epoque-de-qianlong>