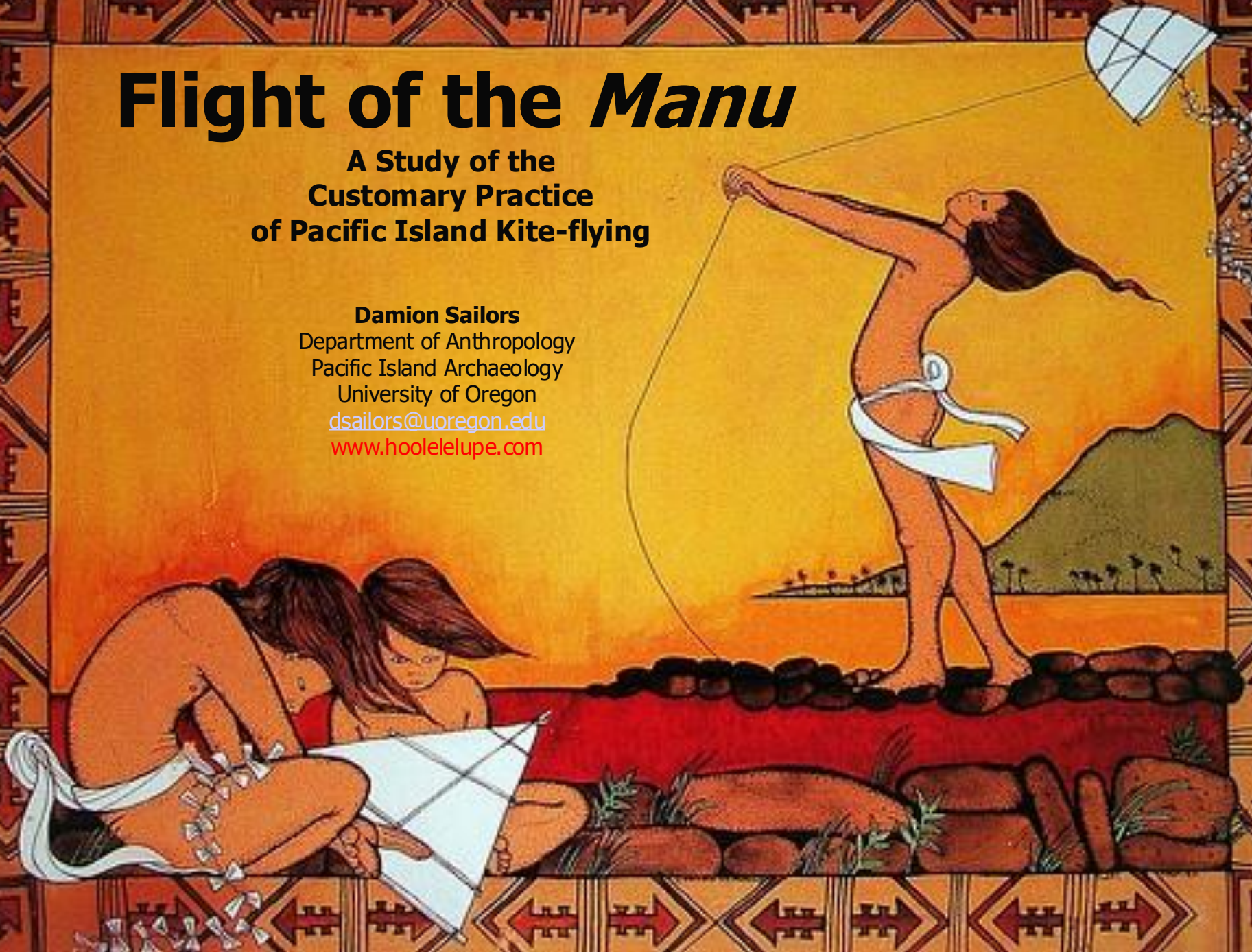


# Flight of the *Manu*

A Study of the  
Customary Practice  
of Pacific Island Kite-flying

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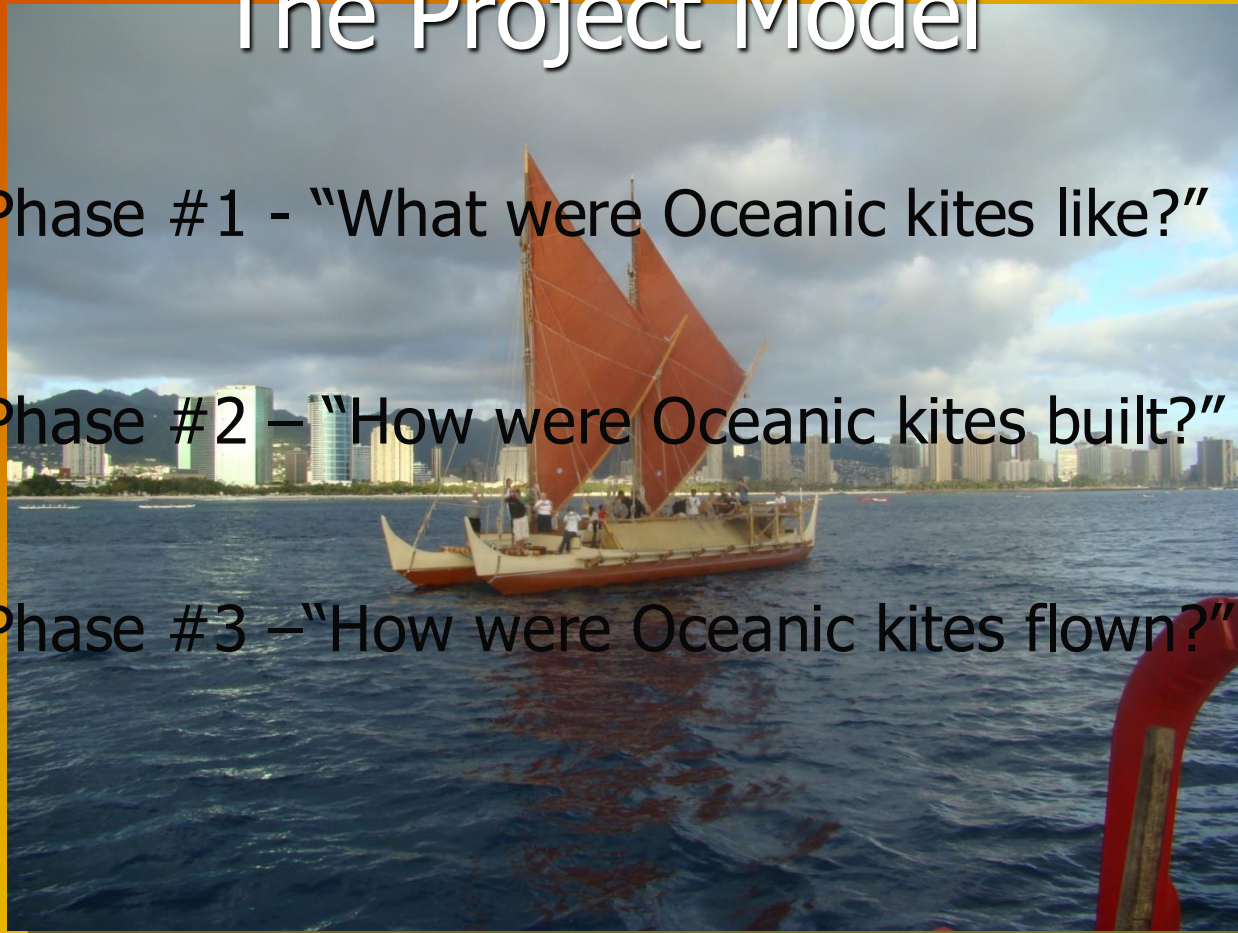




The Replica Voyaging Canoe – “Hokule’a”

# The Project Model

- Phase #1 - “What were Oceanic kites like?”
- Phase #2 – “How were Oceanic kites built?”
- Phase #3 – “How were Oceanic kites flown?”

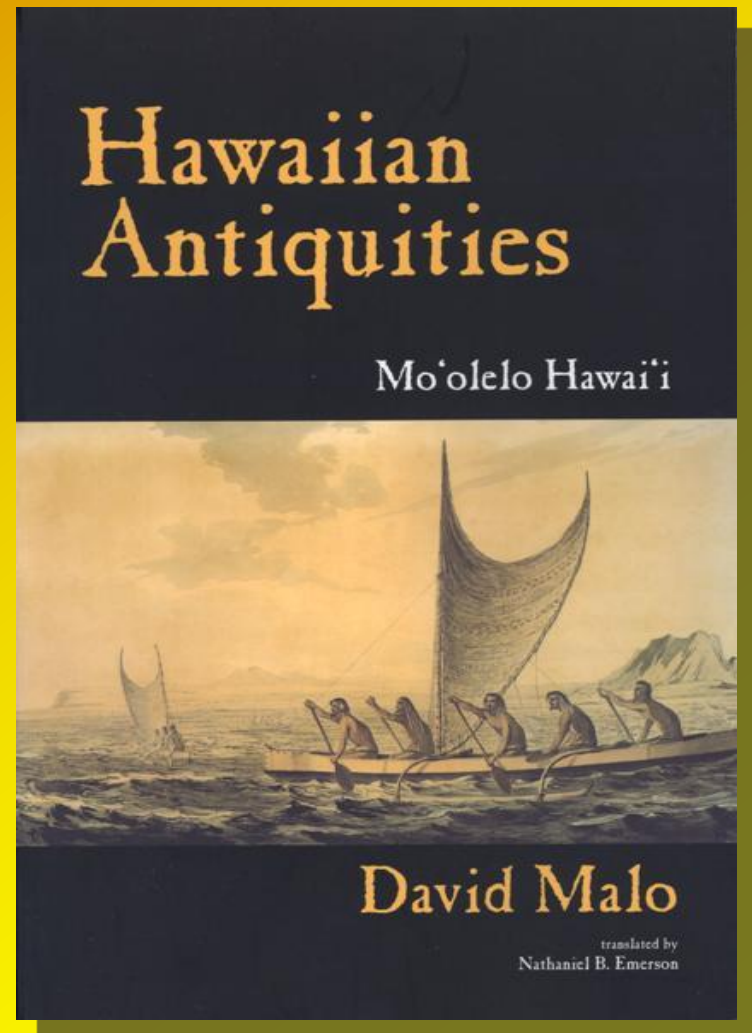
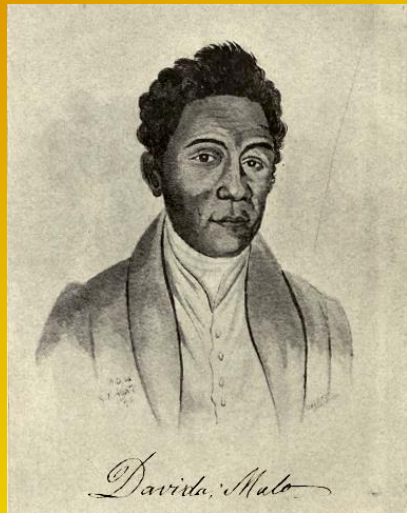


"Experimental Archaeology": The systematic approach used to test, evaluate and explicate method, technique, assumption, hypothesis and theories at any and all levels of archaeological research." (Ingersoll, Yellen, Macdonald, 1977)

# Customary Kite-flying in Oceania

As supported by oral tradition and ethnographic accounts

*"Kite-flying, deserves special mention as a pastime that was dear to the Hawaiian heart, the practice of which recurred with the regularity of the seasons"*  
(Malo 1836)



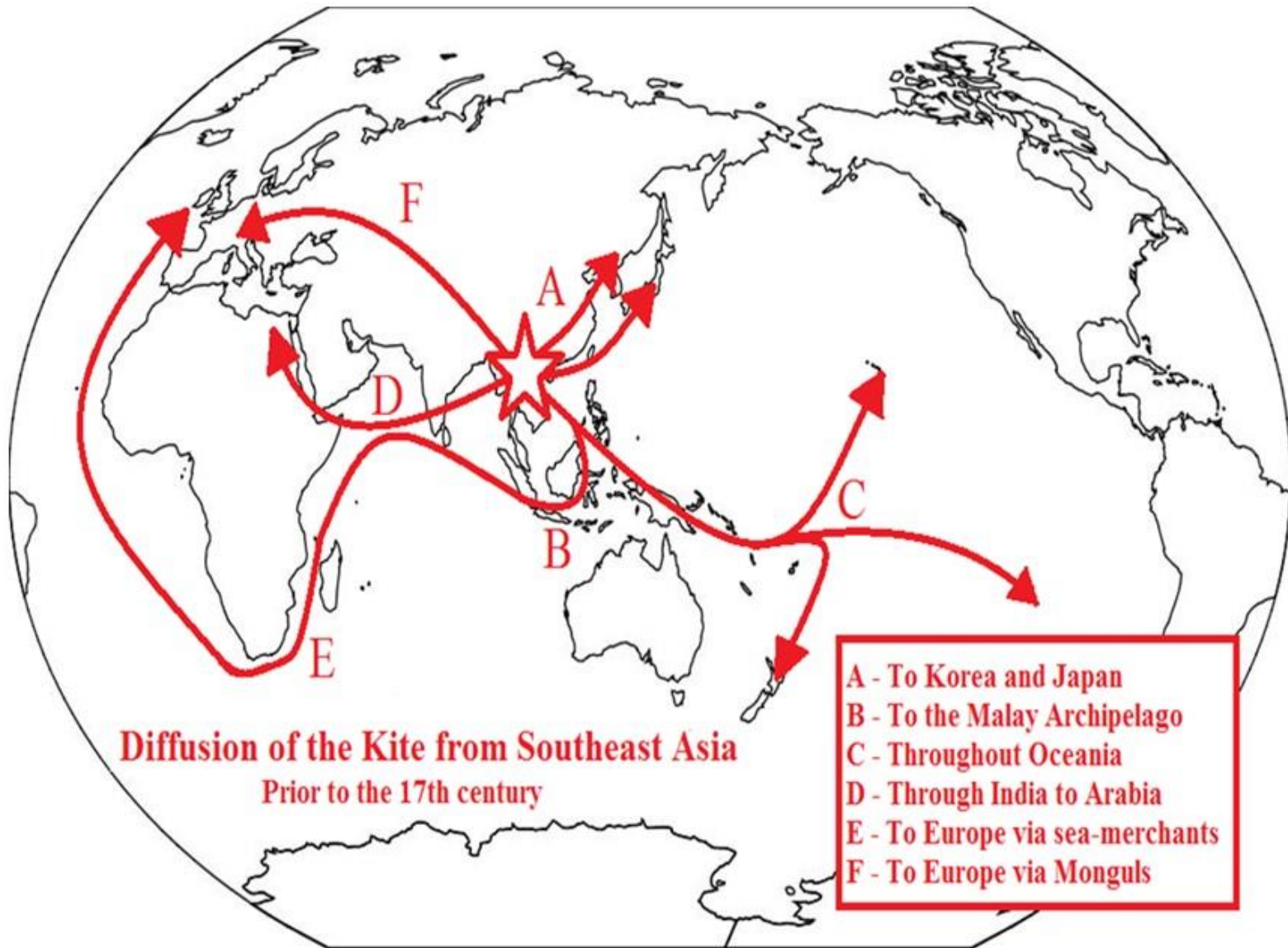
# Customary Kite-flying in Oceania

As supported by oral tradition and ethnographic accounts

- Fishing
- Religion / Divination
- Meteorology
- Locomotion / Traction
- Kite-fighting
- Recreation

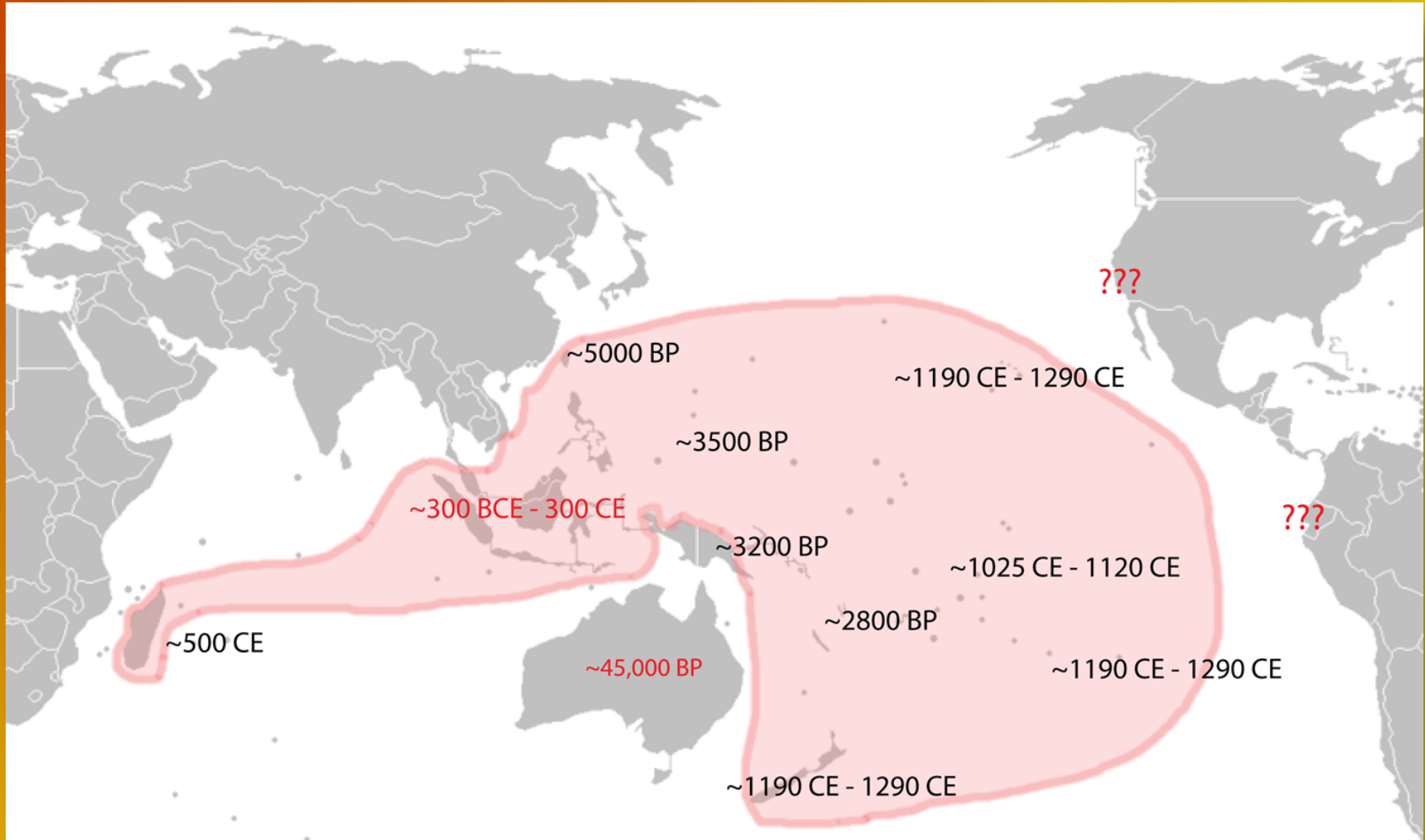




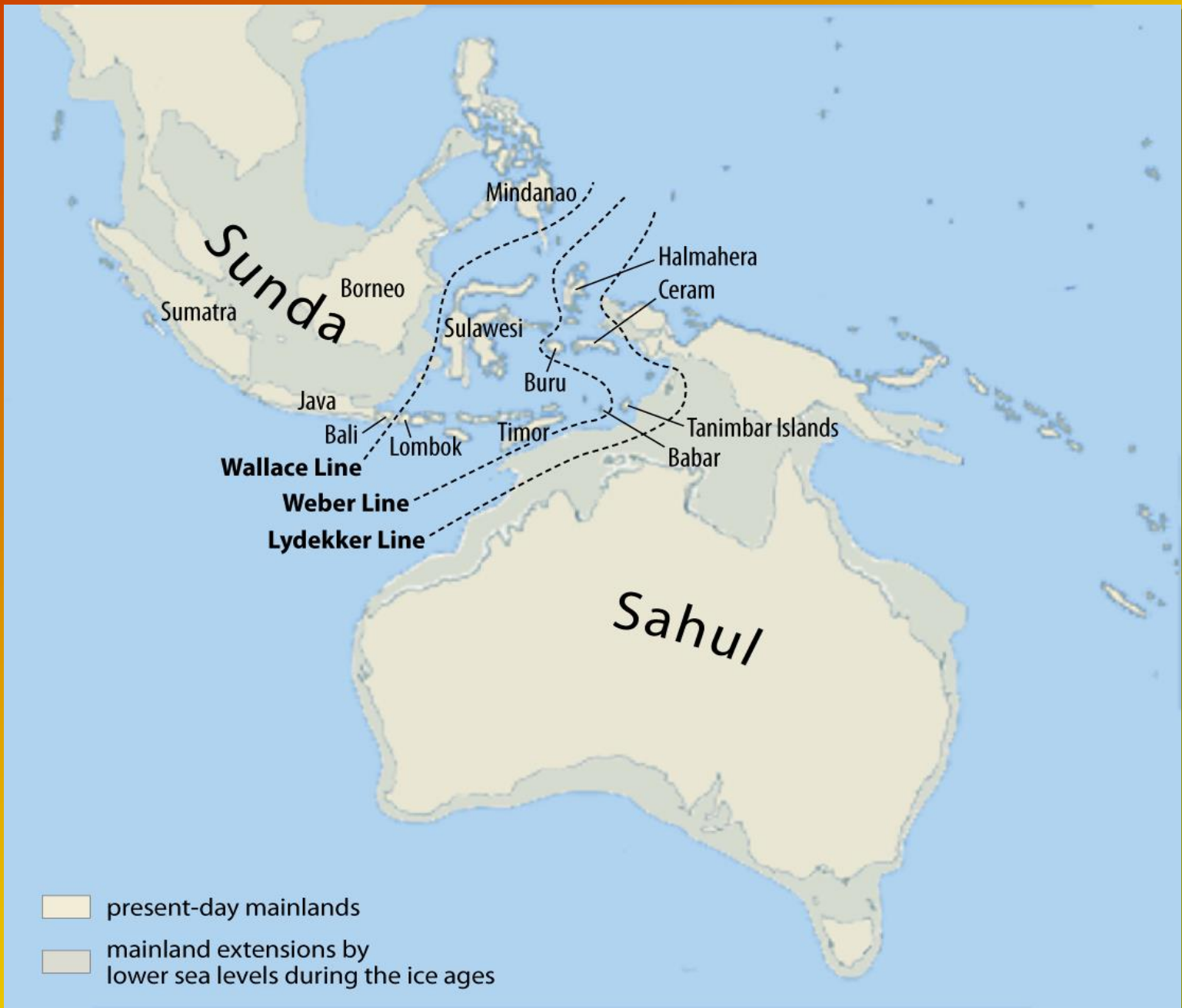


**Diffusion of the Kite from Southeast Asia**  
Prior to the 17th century

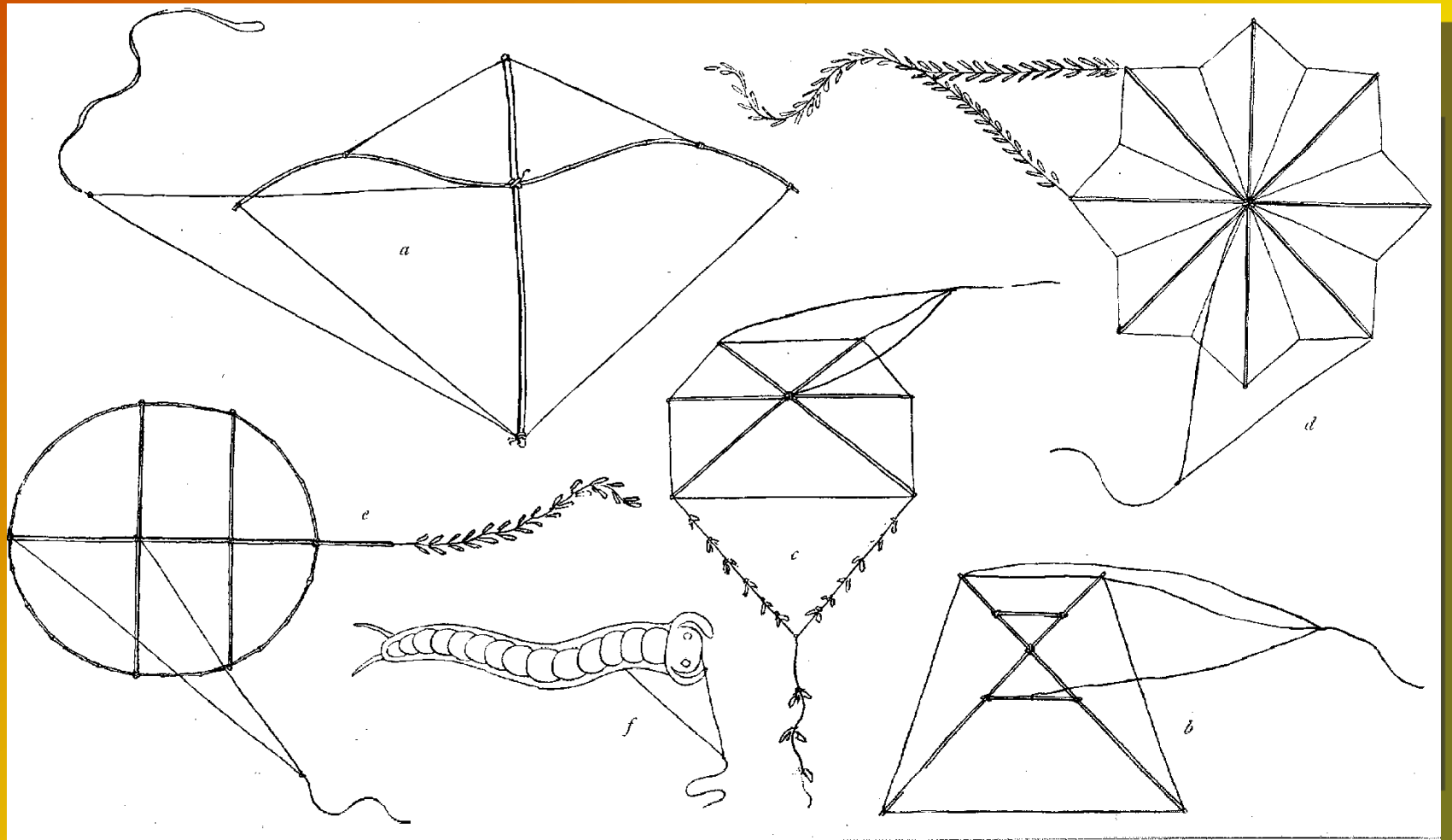
- A - To Korea and Japan
- B - To the Malay Archipelago
- C - Throughout Oceania
- D - Through India to Arabia
- E - To Europe via sea-merchants
- F - To Europe via Monguls



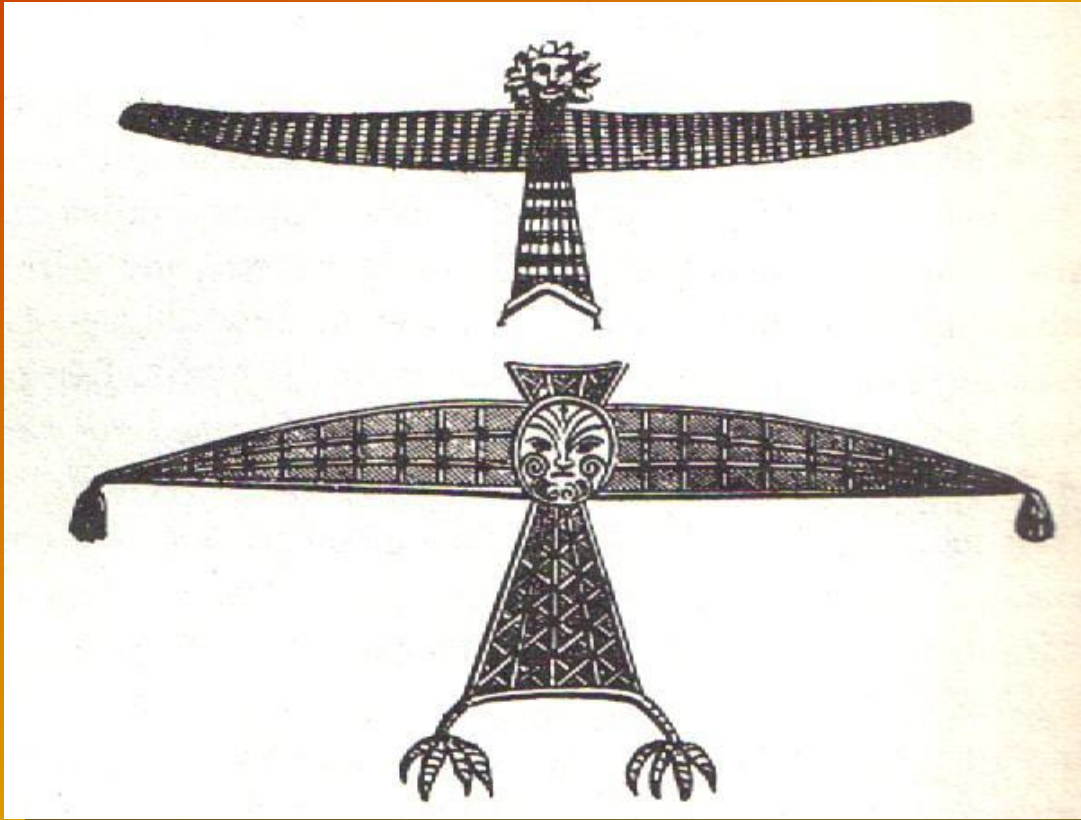
A General Chronology  
of the Austronesian Expansion



# Methods – Phase #1



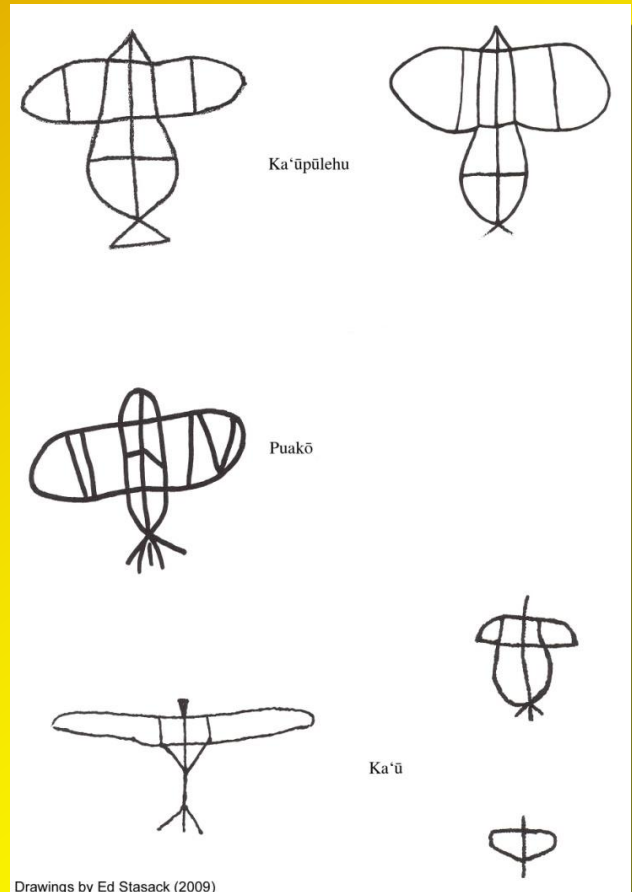
# Methods – Phase #1



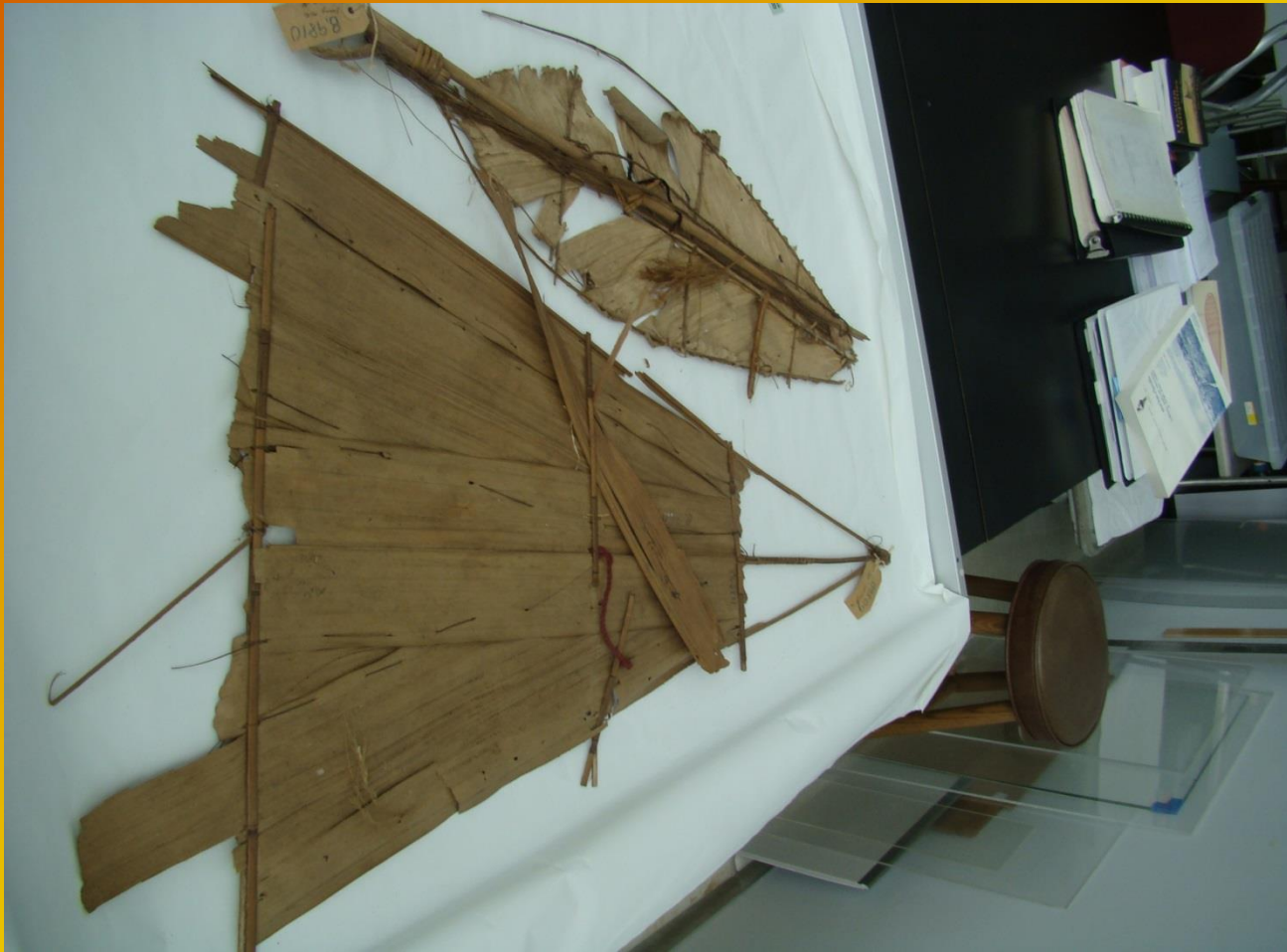
## Primary Objective:

To generate empirical and observational data on customary Oceanic kites through experimental means

What was a customary Oceanic kite like?



# Bishop Museum Kites



# Composition of Hawaiian Kites



**“Hau”**

*Hibiscus tiliaceus*



**“Ohe”**

*Schizostachyum glaucifolium*



**“Olona”**

*Touchardia latifolia*



**“Wauke”**

*Broussonetia papyrifera*



**“Hala”**

*Pandanus tectorius*



**“Wiliwili”**

*Erythrina sandwicensis*



**“Niu”**

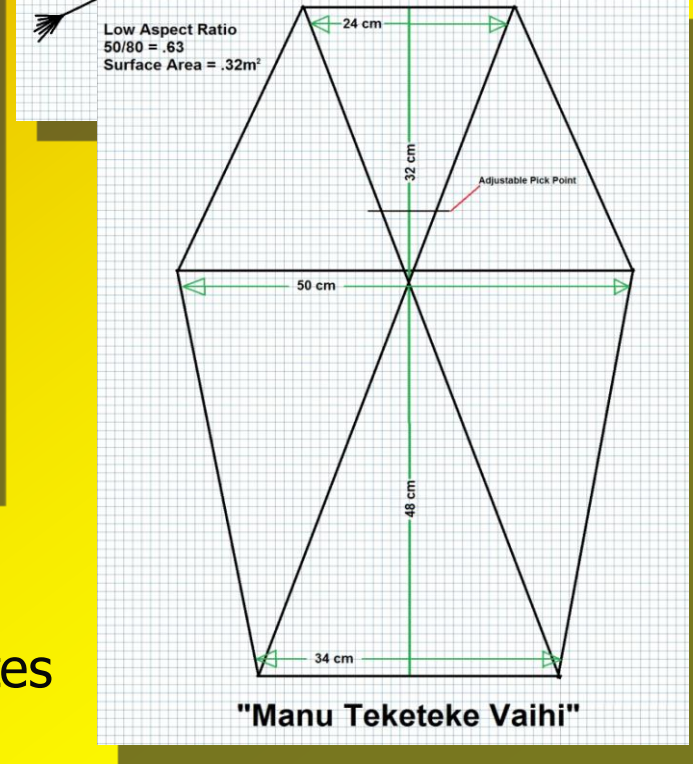
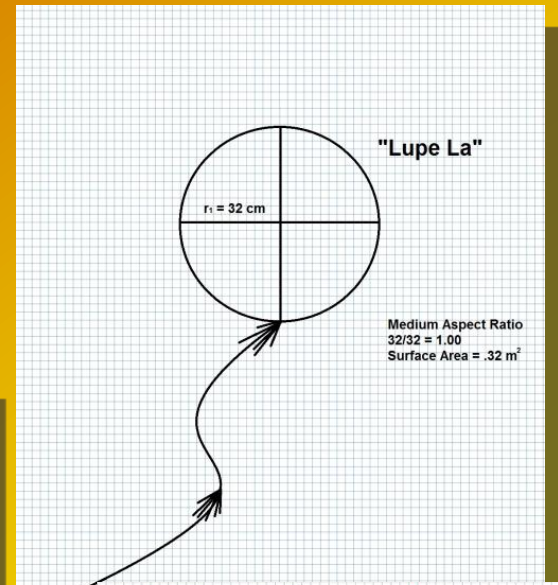
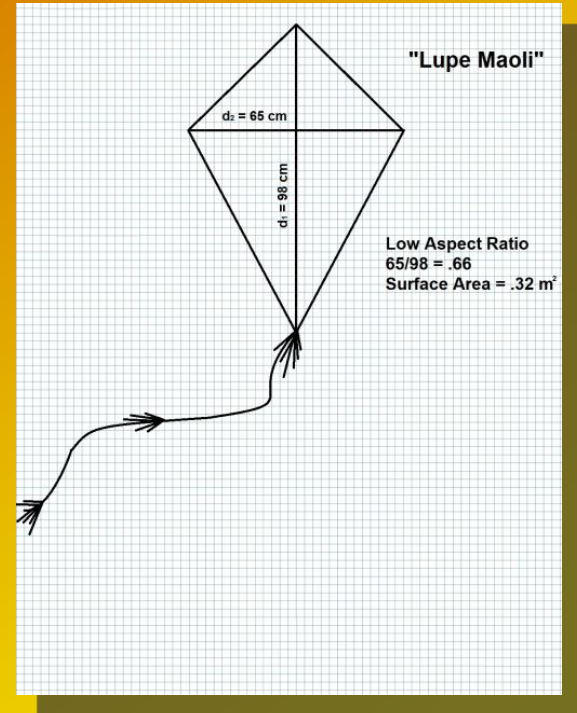
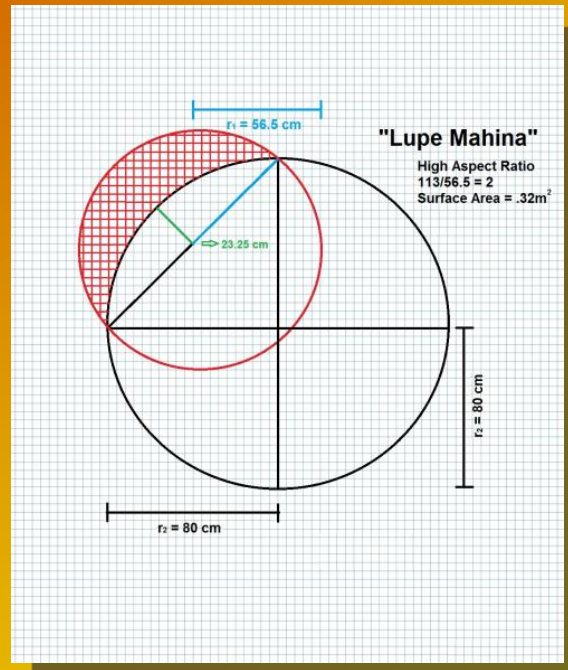
*Cocos nucifera*

# Methods

## Phase #2

Experiment controls:

- *Hau (Hibiscus Tillaceus)* frame
- *Kapa* cover
- .32 m<sup>2</sup> surface area



How were customary kites constructed in Oceania?

# Methods

Phase #2



How were customary kites constructed in Oceania?

# Methods

Phase #3



How were customary kites flown in Oceania?



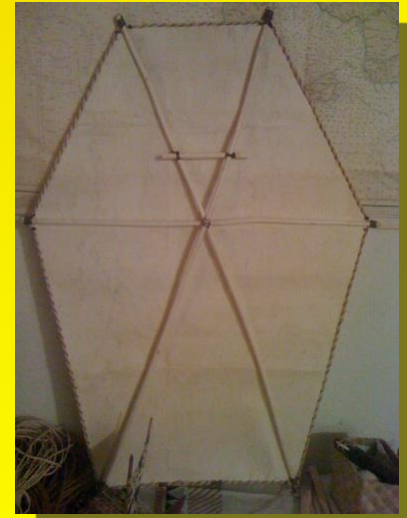
*Lupe Maoli*



*Lupe La*



*Lupe Mahina*



*Manu Vaihi*

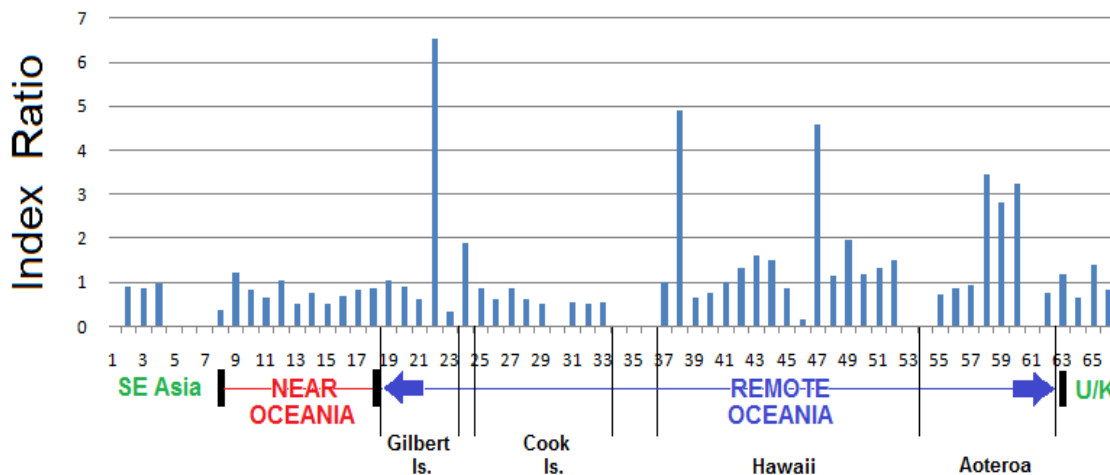
# Results and Discussion



## Shape Analysis:

- Kites of East Polynesian origin have a trend for a very "High Aspect" design when compared to kites of Near Oceania (65 samples)
- Index Ratio = width / height

Aspect Variation of Oceanic Kites

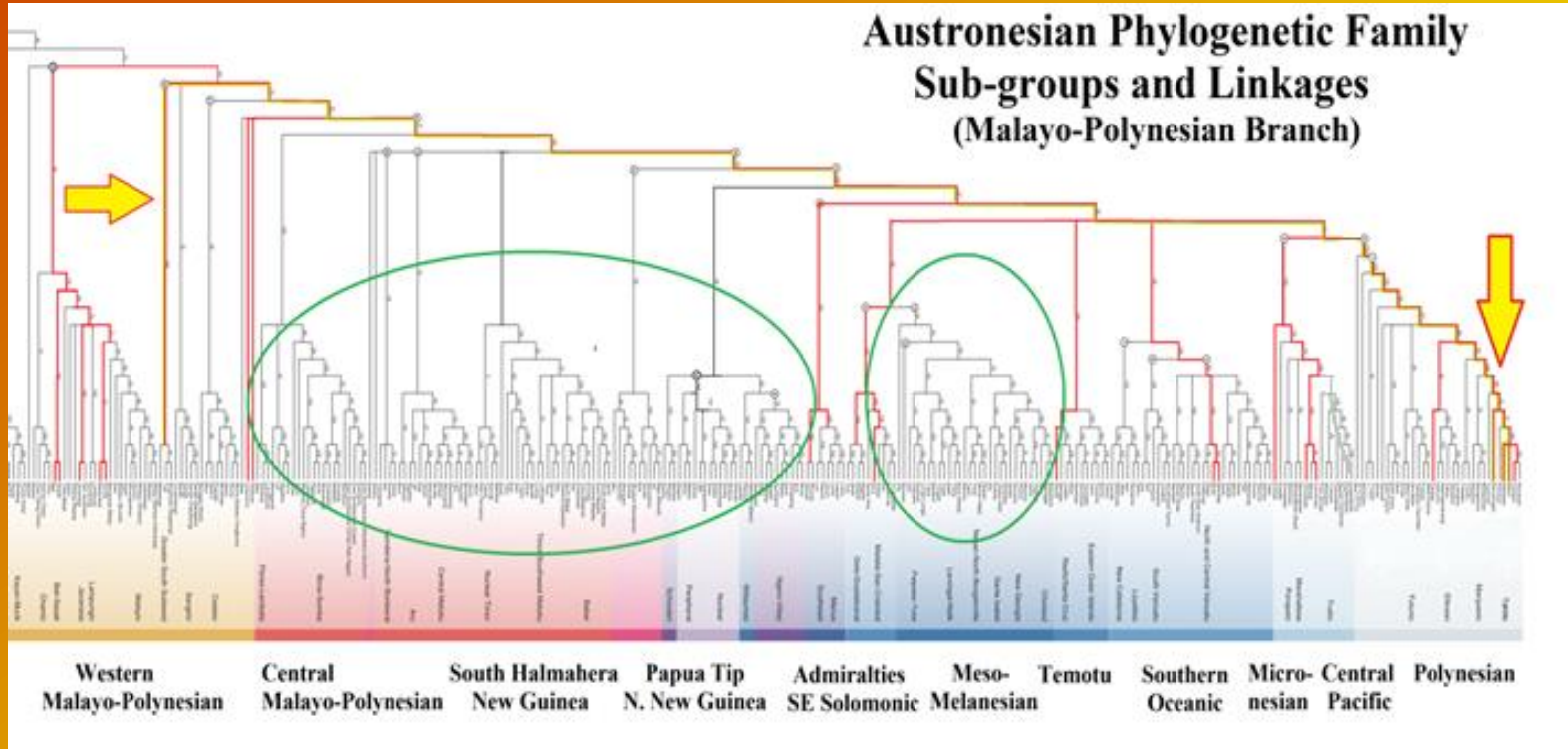


# Results and Discussion

## Flight Observations

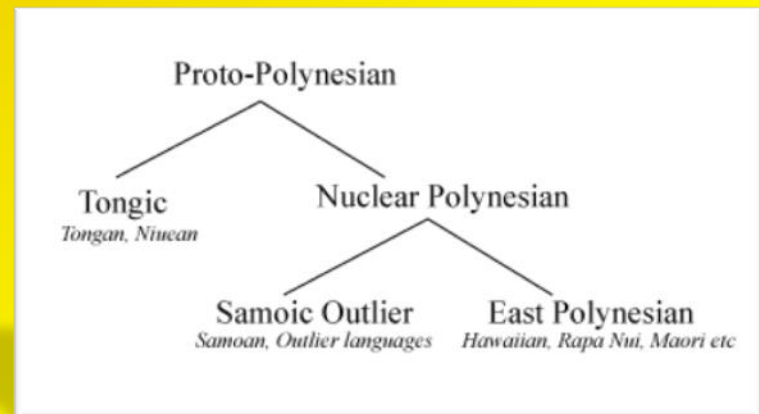
| Kite type<br>(.32 m <sup>2</sup> )                            | Flights | Beaufort<br>Wind Range | Aspect<br>Index | Stability<br>Value | Tail bonus<br>(1 span = 46 cm) | Weight |
|---|---------|------------------------|-----------------|--------------------|--------------------------------|--------|
| <i>Manu Teketeke Vaihi</i><br>Cook Islands Kite<br>Low Aspect | 3       | Force 3-4              | .63             | 0.72               | + 0.2<br>5 span                | 125 g  |
| <i>Lupe Maoli</i><br>"Native Kite"<br>Low Aspect              | 5       | Force 3-5              | .66             | 0.70               | + 0.2<br>5 span                | 100 g  |
| <i>Lupe La</i><br>"Sun Kite"<br>Mid Aspect                    | 5       | Force 3-5              | 1.0             | 0.28               | + 0.1<br>5 span                | 170 g  |
| <i>Lupe Mahina</i><br>"Moon Kite"<br>High Aspect              | 2       | Force 3                | 2.0             | 0.00               | U/K                            | 145 g  |

# Results and Discussion



## Historical Linguistics:

Kite terminology shows close linguistic similarities between Hawai'i, Cook Islands (Southern) and New Zealand





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Dr. Carlos Andrade – University of Hawaii at Mānoa

Kumu Maile Andrade – University of Hawaii at Mānoa



# Mahalo Nui Loa!

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