

# POLYNESIAN VOYAGING SOCIETY

BOX 19000-A / HONOLULU / HAWAII 96817

## MINUTES - RESEARCH COMMITTEE

Monday, June 8, 1987

Members Present: Will Kyselka, Nainoa Thompson, Ben Finney,  
Myron Thompson

The Research Committee will complete their obligation in recording and publishing the scientific materials related to the Voyage of Rediscovery. Popular presentations will follow.

### A) Polynesian Journal of New Zealand

- 1) Detailed description of New Zealand leg
- 2) Detailed description of Samoa-Tahiti leg
- 3) Expansion of Finney's article submitted to the American Anthropological Society to include Tom Schroeder's insights ("Sub Tropical Westerlies: A Third Way to Reach Eastern Polynesia")

### B) Articles to be completed:

- 1) Hawaii-Tahiti-Hawaii by Dixon/Nainoa
- 2) Short Sails including Tahiti to Rangiroa to be done by Will/Nainoa

### C) Collection of memoirs:

- 1) Cultural impact of the total voyage
- 2) Cultural politics of the voyage
- 3) Sail performances and technical parameters of Hokule'a
- 4) Develop technical paper that answers questions that skeptics have
- 5) Chants that have been composed with full translation



VOYAGE OF REDISCOVERY

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Research Committee

After above has been put together as basic core of documentation materials, PVS should consider a popular presentation based on the information produced by the technical, scientific materials.

Immediate action request:

- 1) That charting of the total course of the sail be incorporated into a computer program which could be utilized to expand/contract charting for particular needs.
- 2) Person to hire to work closely with Nainoa in transcribing tapes of the last leg.
- 3) All original documentation be gathered and given to Marlene to be stored in a fireproof area such as the University of Hawaii and Bishop Museum.
- 4) All duplication costs be absorbed by PVS.
- 5) Popular articles written for sailing magazines.



To: Marlene, Elisa, Cliff, Will, Ben, Dixon, Bob W., Cary, Gail, Peg,  
Nainoa and Jim O'Hara

From: Pinky

Re: Sail and Navigational Documentation Possibilities as Outlined by  
Nainoa

Please review for your insights as to requirements and what  
other areas of documentation focus would be important. Please be  
prepared to discuss the technical requirements at achieve desired  
outputs.

Marlene will be calling for the time for a meeting which  
meets your time requirements.

Merry Christmas

12-15-86

TO: Documentation Team

From: Nainoa

Subject: Rough Draft of Info. Re. Documentation Requirements for  
the last 3 legs Tahiti-Rangiroa-Nuku Hiva-Hawaii

### **I. Over View**

--We know more now than we have ever known about navigation  
& sailing Hokule'a.

--This is the best time to document the process.

--These last 3 legs provide a wide range of different situations  
which require all the techniques of navigation and sailing to make  
safe landfall. We will be attempting a lot in a short time.

--Doldrum will provide very good visual shots-both from Hokule'a  
and from the escort boats.

--Targeting Hawaii is the most difficult of all the targets, because of  
its relative small target given it's distance from the place of  
departure.

--We need to fill any documentation and recording gaps to finish  
this project fully and correctly. We will be completing the  
"Voyage of Rediscovery".

---Notes: I feel that the on board documentation: whether film,

tapes or written, must be documented. These include but not limited to:

1. Routine events, sailing, navigation, steering, etc. hopefully from some form of script;
2. Special events--squalls, fish, birds, etc.
3. Logging by--date, time, and what is actually shot.

## II. Sail Schedule

A. Crew arrival Tahiti	6 day refurbish/repair & load	Mar. 19
B. Depart Tautira	1 day sail	Mar. 26
C. Arr. Papeete	2 days-provisions/ceremonies	Mar. 27
D. Depart Papeete	wait for wind & transit	Mar. 28
		3 day wait/sail
E. Arr. Rangiroa	change crew, provision,rest	Apr. 1
F. Depart Rangiroa	wait for wind & transit	Apr. 4
G. Arr. Nuku Hiva	change crew,provision,rest	Apr. 25
H. Depart Nuku Hiva	wind, wait	Apr. 31

\*Lat. of Hawaii @ 24th May - latest date

\*very critical - full moon May 23rd

Long. of Kumukahi max @ 27th May latest

Milolili max @ 28th May latest

Kualoa (by demand) 30th May (9:30 am)

### III. Sail Plan - For Documentation Purposes

#### A. Tahiti - Rangiroa

##### 1. Focus -- on navigation and sailing

###### a. Navigation:

Navigation & sailing can be described as intense over short periods of time. Will investigate sailing for specific single islands opposed to large groups of islands as targets. We will investigate the difficulty the early Polynesians faced in sailing and navigating near dangerous reefs like the Tuamotus. Navigation has to be accurate enough to target islands only in the day light hours to avoid dangerous reefs. We will investigate non-visual techniques of island locating. Investigate techniques to lay off islands & reefs at night to avoid the dangers of sailing at night. We will use other clues such as birds, & fish.

###### b. Sailing:

Life for crew will not be exposed to the fatigue of long voyaging, but will be quite active. Crew needs to be alert, and quick acting with so many reefs around. There will be a lot of

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tacking, adjusting of rigs, sail trim, steering,  
anchoring, etc.

2. Areas for possible filming & other types of documentation

a. Pre-sail preparation

1. rigging canoe
2. loading of provisions
3. training of crew
4. sea trials of Hokule'a

b. Specific Port to Port or Island to Island Sails.

1. Tautira to Papeete - short, one day sail (40 miles)

a. Navigation

1. Basic coastal navigation, will  
never be outside of sight of  
island of Tahiti

b. Sailing

1. Tacking of Hokule'a, avoidance of  
reefs, entering small passes  
into inside of reefs
2. Basic sailing handling of Hokule'a  
near islands and reefs

2. Papeete to Tetiaroa - short, one day sail (26 miles)

a. Navigation

1. Basically still coastal navigation

(Tahiti should always be in sight) sail should be complete in daylight

2. weather selection

3. back sighting island as target

4. selection of sail time (timing speed of canoe with sun)

5. steering mostly with Tahiti in sight

6. targeting Tetiaroa - atol

a. birds

b. height of coconut trees

b. Sailing

1. weather selection

2. sail setting, steering

3. emergency procedures

3. Tetiaroa - Makatea (90 miles - overnight sail)

a. Navigation

1. back sighting atoll (Tetiaroa)
2. steering celestially (day time)
3. steering celestially (night time)
4. determining speed - to control  
time of arrival at Makatea
5. birds
6. visual clues - height of isle  
(raised atoll--only a few in  
Polynesia)

b. Sailing

- |                                 |                      |
|---------------------------------|----------------------|
| 1. steering                     | 6. watch<br>system   |
| 2. sail trim                    | 7. sleeping          |
| 3. emergency procedures (night) | 8. crew "space"      |
| 4. seamanship                   | 9. occupying<br>time |
| 5. cooking                      | 10. fishing, etc.    |
4. Makatea to Rangiroa - (41 miles - less than  
a day)

a. Navigation

1. bare pole off shore Makatea to  
time arrival at Rangiroa at

dawn next day

2. choice of weather
3. holding position near island
4. backsighting island of Makatea

b. Sailing

1. sailing celestrially at night
2. timing Rangiroa at dawn
3. make sure keep track of speed
4. avoid leeward reef of Rangiroa  
in darkness--there are no  
coconut trees
5. sail to windward side as soon as  
possible
6. need to tack up wind to Passe,  
will probably not make it in  
the daytime
7. sail off island or could anchor on  
lee side west until dawn then  
have rest of day to tack to  
Passe
8. sail into Passe, on solar tide,  
then anchor



B. Rangiroa to Marquesas (leg 2) - General Plan: April 6th -  
May 4th; Course: 44 T 580 mi. to Elao

1. Summary of Considerations related to this leg:

a. Historical;

Strong archaeological evidence indicates that the Marquesas may have been the first inhabited island group after the Polynesians expanded out of the Samoa-Tonga area. This suggests the Marquesans to be the oldest inhabitants of the eastern polynesian islands.

A sail leg from the Marquesas to the Tuamotus could possibly suggest the expansion of the Polynesians out of the Marquesas into the Tuamotus and further outward. But we are going the other way. I am not sure that this leg, in the manner in which we are doing it, relates to the basic historical movement of the Polynesians. May be good to leave the question with Ben Finney, Yoshi Sinoto, etc.

2. Sail Plan Considerations;

There is a time constraint. We need to be in Hawaii by June 1st:

- a. To avoid the central north Pacific summer hurricane season;
- b. Because by June 10, the southern cross will not be available to use to target the latitude of the Hawaiian Islands.

The departure date out of Tahiti must be maintained. An earlier departure date will bring us into the southern hemisphere's hurricane season.

We therefore have the month of April to reach the Marquesas.

I chose to depart from Rangiroa because of the approach to the Tuamotus from Tahiti. It is dangerous to approach the Tuamotus from Tahiti any farther east than Rangiroa.

It is too wide to sail through in daylight hours, and too dangerous to sail at night.

So we have an upwind leg with approximately one month to complete. I am not sure Hokule'a could tack to the Marquesas in a month with the possibility of light easterlies or northeasterlies. No matter what, to have to tack to the Marquesas would be a long,

difficult trip. You would not want to involve yourself with such difficulty, knowing that right after that you have to sail 2,000 miles to Hawaii.

We will wait in Rangiroa until the trade winds shift south of east to a position that will allow Hokule'a a chance to sail to the Marquesas without tacking.

There is an option to sail to another island called Manihi which is 95 miles east northeast of Rangiroa. From here we would be in a better position geographically to sail to the Marquesas.

If we sail straight from Rangiroa to the Marquesas it may only take 4 to 5 days. It depends if the winds we leave on stay favorable throughout the whole passage.

b. Navigation -

1. Course strategy - will develop two courses
  - a. A straight course given the wind is favorable to make landfall in one tack.
  - b. To tack to Marquesas.

2. Direction

Leg should be considered extensive--will use all of the clues for both day and night direction holding

3. Latitude

Plays very important role in targeting the islands especially if we need to approach from the west against the trades. Main stars will be thoroughly studied before we leave Hawaii. We may need to tack in the latitude parameters to gain our easting as well as making our landfall. Very important.

4. Targeting

Visual - back sight Rangiroa. Initial course dead reckon islands Ahe and Manihi in daylight hours. Back sight Manihi as last sight of Tuamotus. Birds will be used to find the islands also. Marquesas are high islands (as high as 4,000'). May use birds for targeting, but also may see islands first.

c. Sailing (summary)

1. More extended sailing procedures - 24 hour routine of life at sea.
2. Basic sailing efforts
  - a. Trimming sails to stay close to the wind
  - b. Steering
  - c. Tacking procedures
  - d. Fishing
  - e. Maintenance and cleaning of canoe
  - f. Storm sailing
3. Additional notes:
  - a. Since we will be on an extended leg on open sea, prior to our departure we will not be able to forecast our weather for maybe more than two days. In the event we get caught in a storm, we will use all of our storm procedures.
  - b. This leg could be very interesting if we need to tack to the Marquesas. Although we have never done this before, I feel we are at our best, since the canoe is best equipped and the crew most experienced.

12/12/86

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C. Marquesas to Hawaii - April 31 to May 19th - 28th

change crews

reprovision & re-fit Hokule'a

crew rest (over 7 are on both legs)

1. Summary of Considerations related to this leg.

a. Historical Significance (Mar. - Hawaii)

Archaeological evidence strongly indicates that the first people to colonize Hawaii were from the Marquesas. Which makes this leg very important. There is no existing evidence that these earliest arrivals went back to their homeland. Suggesting there was no two way voyaging. Some could argue that since no two way voyaging, that the initial leg to Hawaii may have been accomplished by sailing without navigational technique. But my contention is that most likely they had the means to hold a course and direction.

1. Hawaii is first too far away to sail

without at least holding a desired course line, requiring the ability to know at a minimum of How to Hold Direction. You can't sail in circles

to Hawaii, you can't drift to Hawaii from the Marquesas.

2. A return trip from Hawaii to the Marquesas given any type of trade wind could not be done on one tack. To tack to the Marquesas would take a very long time.

3. There is evidence that Marquesan people have sailed to many parts of the Pacific. In that type of sailing the minimum ability of being able to at least hold direction was probably necessary.

2. Basic Sail Plan - Estimated departure Apr. 31

- a. Marquesas to 4 degrees N = Course due with  
780 mi @ 120/day = 6.5 days
- b. 4 degrees N to 9 degrees N Doldrum = course  
due with 300 mi @ 150 mi/day = 6 days
- c. 9 degrees N to 20 degrees N = Course 57 degrees  
N of West 780 mi @ 120 mi/day = 6.5 days  
with current set of 10 mi/day West for area  
in 1 and 3 will be 13 days = 130 mi West
- d. @ Lat. of Hawaii 20 degrees N to ? = 260 mi @

120 mi/day = 2.3 days

Total = 21.3 days

\* Key is Full Moon May 13, latest date to be at latitude of Hawaii at May 24th

Sail is mostly wind on the beam or abaft beam on trades.

Requirements for departure is moderate tradewind with no indicated storms. It would be unlikely to have to wait more a couple of days for good weather from the Marquesas.

Range of sail time--Total Distance = 2,200 mi.

Miles/Day	# of Days
80	27 (Hawaii to Tahiti average)
90	24
100	22
110	20 (Tahiti to Hawaii average)
120	18

Most probable sail time = 21.3 days

### 3. Navigation Course--

#### a. Course--

All navigational information will be put in the



course line.

Course Line - will be the reference that we sail  
by the line that we orientate ourselves at sea.

This is a long voyage of basically one tack.

(Unlike from Tahiti to Marquesas)

b. Direction--

Use all clues day and night

Most difficult task of getting thru the doldrum  
area. Max. cloud area

Fatigue is a factor (length of voyage)

Requirements to keep now. in frustration  
stored over long periods of time.

c. Latitude--

Important to determine as we keep reference  
to course line

Most critical information to target the  
Hawaiian Islands

Will only use one star clue for latitude of  
Hawaii, since it is the most accurate one for  
the latitude of Hawaii. Hope it is not too  
cloudy.

d. Targeting--

Open ocean passage, once we leave the

Marquesas--we should not see any other island but the Hawaiian Islands.

Hawaii lacks large numbers of Manuku and Noio birds which we use to target the Islands. So, most likely, we will use the extreme height of the Big Islands or Maui as our target.

e. Weather--

Basic tradewind sailing--the months picked should be free of any low pressure systems in both the northern and southern hemisphere. Doldrums--may be extensive or it may not. Spring months the doldrum tend to be less extensive than the summer and winter months.

But Doldrums conditions present two things--

1. Visually the most dynamic area in the tropical Pacific
2. It is the hardest place to navigate, it is here where we should record the most.

f. Storms--

These months are the best to have the lowest

possibility of tropical cyclones in both northern  
& southern hemispheres. Maybe some power-  
ful squalls in the doldrums will require storm  
sailing procedures.

g. Sailing--

All facets of sailing Hokule'a on a long voyage.

mechanics of sailing & steering

watch duties & responsibilities for:

cleaning

maintenance

safety procedures

basic routines of life at sea, adaptation to  
a long passage

Mon. Dec. 28, 1986

5 large paddles Papa, the  
d. Puanoho  
e. m/m Wong  
Royal Pigeon

Will K., Nainoa, Ben F., Cliff. Pinky,  
Larry L. Dixon

[Call Pinky 11:00AM meeting KEMB]  
Call Dick Rhodes re: Larry - paint  
machine]

Purp - to give you ideas  
as to to be done further  
to Nainoa's needs.

Added

Ben F. - Don re: articles. Lost  
2 legs the trav broke.

\*Raret to N.Z. - Will Kyselka  
\*Ben F. will get Samoa to Cooks  
taze. Nainoa has - Mike T. - call  
Mike Tong, Chad B. Paul F. Dick R.

Transmitter problem gets solved.

Call Len - transm. is working.

[trouble shooter on the trip - as Ben]

May 1 to send an electrician down.

Jim I may have 2 sec. boats  
Jim O'Hara & Dreas

Jim may solve Cliff's technical ~~points~~ problems.

Get shots more flexibility.

- Log more clearly -

Dorcas - Tell Peg, 1 separate person for making documentation. Because Dorcas had to bust butt to keep up - 1 person to keep track!

Jim do it - relieve her & resp.

Look at a single indi to do this

Bertram 50' motor yacht

May. Steadiest of winds

Dixon - we need to start saying identify down. video, logging, scientific, etc. Reso. to be more

- specific people interview Naenoe
- to show what is on the canoe
- obvious 1 specific direc's what kind of shots be what

do we need to that shooting  
script — more detail! Birds  
on islands...

✓ Lot of stuff we see / the camera  
will not. Spoke to Cliff.  
Write out in detail

Rec.

1) Dixon's rec.

✓ Need a shooting script  
of specific kind of docu  
log, video

✓ Transcript tapes N.2.

Both not clear — talk into microphone

✓ Rumbach Marquesa's — make mst  
sense in Dixon putting info. down.  
Do 2 logs + interviews

✓ Films audio + written report  
more exp + video

✓ Video bad weather

wheels missing the last 3' up -

Need to peel in the gaps.

- Sound system -

- Regts FP put to provide as  
ie. helicoptered to get  
cruising rig under sail,  
Pahiti & Teliaroa  
Kern B will shot aeriels  
in.

- Transp in's — need to be  
trained

- Snd carried into mach. Pres & doing  
the interview

- Aerial shots of canoe / both ends

- Explicit inst's as to if goes  
to forth. Enough to cast  
doubt.

Protocol as to the rules.

- Success in doc in the planning.

What we can get & not get. Put it  
down so Gen. public  
understands for instance  
swell patterns

- Larry Loganhill computer work out  
swell patterns

- Wayf. <sup>finding</sup> prog - rough outline or treatment  
elem. junior high, adult is /s  
break it up  
is. <sup>new</sup> ~~new~~ <sup>easy</sup> weather good  
" Bad in doldrums  
applies to the weather  
gives you

- Doing it in Hawaii - Stage 2 of it
- Can't stage navigational effort
- Black & white photos
- Gross outline about wayfinding  
4 scientists applied to  
lost 31 eggs.

Ideas for shots  
Use computer paint.



Need a focus

"A Day in Life of Navigator"  
" " " " " a crew member "

KGMB - 90 min - show

1-good day 1-bad day

Storm sail

need to film a leg - shows the  
process 2 legs to end.

good meat

bad meat

& a whole leg.

Develop educational film

When are you leaving?

Need to pick up tapes  
from Mike & Nainoa.

Leave Monday 5 Jan

return Mon AM 19 Jan

leave Tues 26 Jan

return Sat. 31 Jan

POV - eat til

~~late~~ mid Feb

KGMZ will give us all tapes.  
in raw form.

- make it comprehensible to the general  
public / artistic presentations.

- Need to have a reporter on  
to get the "song" in  
manipulate & massage it all?

- Somebody write the script

- Why imp't to include - or it relates  
to living here in Hawaii

big - to the gen public  
it's accomp as to history.

info to people in the  
academic area.

MEMO

To: Dixon, Lee and Will, Ben

From: Pinky

Re: Attached material

Please review and call in your manao to Laura or me by  
10-31-86. Am asking Marlene to set up and Documentary Committee  
meeting at a time convenient to all to:

Refine our present planning

Develop approaches to meeting our "On Board"

video objectives

Thank you.

See you then.

10-26-86

Draft Summary of Meeting of Documentary Committee

10-24-86 w/ Dixon Stroup, Lee and Will Kyselka, Ben Finney

Purpose: To review existing "on board" film and video cassettes to determine what more on board filming is needed for documentary and or/educational purposes.

Cassettes reviewed: - "On board footage"

1. 1985 Tahiti leg
2. Cook Island leg
3. New Zealand leg
4. Tahiti - Loganbill

Tahiti Leg - At 10 minutes, there were shots of rain and evidences of wind but these types of filming <sup>e</sup>need to be refined in future filming. At 19 through 21 minutes, there were shots of low lying islands and atolls, again future clarity is necessary as well as commentary as to sighting possibilities, distances and so forth. This video does not include navigational or steering materials.

Cook Islands Leg Generally the shots were not fixed on a particular scene or subject long enough to gather any sequential educational materials. Zooming and panning interfere with gaining usable materials. There were interesting shots of Mitiaro islanders and the exchange of food. The contrast of clothing or lack of such, between islanders and Hokule'a crew was interesting. This is noted from 30 seconds through 2 minutes. Between 3 and 6 minutes there are some interesting shots of sail raising and adjustments. At 9 minutes there were some but too short shots of waves. This film points out the need for filming of Hokule'a in full sail under varying sea conditions, taken from another vessel. Also there is the making of sequential filming of a particular topic -- fish catching, prep,

cooking, meal, etc.

The thought that shooting scripts should be prepared before we undertake the last three legs was introduced. Question was raised as to whether 2 cameras would be useful. For instance, when a steering paddle is raised, what does it do to direction change if any of the canoe, etc. Also in terms of course setting and course maintenance by crew, this sequential filming is necessary and should be planned for in the next 3 legs.

New\_Zealand\_leg This material is interesting for use from the following time frames:

1. 1 minutes - canoe preparation before launching is good
2. 15 - 17 minutes - discussion between Mike and Bruce

re:fishing equipment

3. 24 minutes - fish prep by Bruce
4. 25 minutes - sequential possibility of fish catch from 24 through 25 and 26 re: cooking, etc.

5. 33 - 41 minutes - "back wind" shots and steering requirements are interesting and need commentary. Life aboard and Stanley's contribution is to be noted. This film shows "wing on wing" (?) of sails.

6. 44 minutes - squall and change of clothing is noted
7. 50 minutes - shots of whale pod
8. 56 minutes - war canoe

Tahiti--Larry\_Loganbill The overall film, beginning 106 minutes and through 213 minutes, is excellent for documentary and educational purposes. This cassette should serve as our basic "on board" film. The concensus was that this material provides:

1. the base for detailed development of shooting scripts

sequential topic filming of such subject as:

- a. life aboard -- waking, full day activities of one person
- b. changing of sails, sizes, types and reasons for such
- c. navigational decisions as affected by environmental conditions:

- 1). cloud conditions
- 2). wave action
- 3) birds, etc
- 4). locating landfall and sequential steps to final sighting

2. Excellent material to be reviewed by documentary people as well as educators before the next sail to elicit structuring as well as what more is needed.

3. Future opportunities to avoid mistakes in filming. A comparison between this material and the other three leg materials points out the rationale for avoiding zooming and panning. Also time concentration on subject matter is necessary.

The committee also felt that more shots are needed in areas such as:

1. navigation and all of its ramifications. Narration would be helpful. A cordless mike might be attached to navigator as much as possible in order to document related action to theory.

2. steering in all aspects and its effects on canoe performance.

3. sails management and their effects on canoe performance.

4. long held shots of ocean under different winds, sun angle.

5. convey evidence of motion; bow plunging, etc.

6. some shots of severe weather

7. narration of what's happening is important

Conclusion -- that we must produce more "on board" filming based on detail "shooting scripts". That we secure professional assistance in the production of the shooting scripts and filming of the on board activities.

10-25-86 by M.B. Thompson

# POLYNESIAN VOYAGING SOCIETY

BOX 19000-A / HONOLULU / HAWAII 96817

## RESEARCH COMMITTEE

Thursday, August 28, 1986

MEMBERS PRESENT: Dixon Stroup, Ben Finney, Nainoa Thompson  
Will Kyselka, Myron Thompson

The purpose of the meeting was to:

- a) Review and expand on the goals of the committee
- b) Define a format for publication

The members agreed on the following:

## THE JOURNAL OF THE POLYNESIAN SOCIETY

- a) Six articles will be written and compressed into one and submitted to the above publication.
- b) Ben Finney will be responsible for the overall project.
- c) The writers will be:
  - 1) Dixon Stroup - Hawaii to Tahiti
  - 2) Will Kyselka - Tahiti to Cook Islands
  - 3) Ben Finney - Cook Islands to New Zealand
  - 4) Nainoa/Will - New Zealand to Tonga/Samoa
  - 5) Ben Finney - Samoa (C.I.) to Tahiti. This leg will be treated as two separate units. Nainoa will get ben the log sheets from Samoa to Aitutaki.



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6) Dixon/Ben - Tahiti to Hawaii (via Rangiroa/Marquesas)

Comments: a) The committee hopes to have all interviews completed and a draft written by Christmas 1986.

b) Nainoa suggested the importance of doing a separate chapter on the performance of the canoe. He will put together a rough draft presenting his ideas regarding this subject.

c) Finney suggested that the topic of Hokule'a's performance be best saved for the final volume which could also include the whole cultural and motivational impact of the voyage. Legends could also be utilized.

#### OTHER

- The committee will review on-board footage to determine needs for research.
- Alfred Meyer from the Smithsonian will be contacted to determine his interest in participating in the sail.
- When all logs have been studied from the last two legs, it was suggested that a press conference be scheduled to discuss the significance of these sailing legs.
- Nainoa suggested that a daily weather analysis be obtained to assist with documentation. Bob Worthington will be contacted to obtain the name of the individual in charge of the weather station.

#### CONCLUSION

- The committee envisions the end product being utilized in the school systems as well as the Lawrence Hall of Science and Bishop Museum.

To: Research Committee  
From: Ben Finney

April 5, 1985

#### RESEARCH GOALS

- 1) To learn from first-hand experience about sailing problems over prehistoric migration routes. In particular:
  - a) Tahiti/Raiatea to Cooks to New Zealand
  - b) Western Polynesia to Eastern Polynesia
  - c) Marquesas to Hawaii
- 2) To increase our knowledge of the working of the non-instrument navigation system. For example:
  - a) etak reckoning
  - b) orientation from swells
  - c) bird behavior and landfinding
  - d) swell pattern disruption and landfinding
  - e) tacking to windward

#### METHODOLOGY

- 1) Migration routes
  - a) Search literature (legends, archaeology, linguistics, ethnographic) for evidence on these routes, including anything about sailing conditions, star courses, etc.
  - b) Correlate the above with oceanographic and meteorological data along routes
  - c) Map out feasible routes for Hokule'a and ascertain star compass courses
  - d) Document performance of the canoe from satellite fixes; record cloud cover, wind and swell information from canoe and escort vessel; record tacks, sail changes and sailing problems
  - e) Analyse data from the voyage, and integrate with traditional and anthropological information as soon as possible after completion of each route
- 2) Navigation
  - a) Have Mau and Nainoa work together, not independently, in order to maximize learning
  - b) Develop methods for precise communication with Mau so that we can get as close to his way of thinking as possible
  - c) Record star course headings, wind and swell observations, current and leeway estimations, dead reckoning calculations,

- bird sightings and other landfinding observations, as well as all navigational decisions and reasons for them.
- d) Analyse data as soon as possible after completion of each leg both for a more complete record, and in order to be able to determine gaps to be covered on next leg.

#### PUBLICATION

Rather than wait for the completion of the entire voyage to analyse and publish the data, I propose that a strategy for speedy publication of the preliminary results of the voyage be developed. One possibility would be to prepare an article on each major leg of the voyage and send it off to press before sailing on the next leg. For example, after arriving in New Zealand, do an article on the Tahiti/Raiatea-Cooks-New Zealand leg. Then, after arriving in Eastern Polynesia (after having sailed from Samoa to the Cooks or wherever the first landfall in Eastern Polynesia might be) do an article on that major leg. Finally, upon arrival back in Hawaii, write up the Marquesas to Hawaii segment. I would further suggest that The Journal of the Polynesian Society be the logical place for these articles. This journal, published in New Zealand, is the leading journal for Polynesian studies. Since its inception in the last century this journal has focused on problems of Polynesian migrations. Moreover, they have a policy of reprinting articles in book form. For example, we might be able to take the three articles on the major legs of the voyage, plus the article in preparation on the 1980 voyage, put them together with an introduction and conclusion, and have The Polynesian Society publish them together as a separate book.

We have an obligation to inform our members, the scientific community and the public of the results of our endeavors. This publication strategy would enable us to get the basic material out in a reasonable period of time and have it widely available without publication or distribution costs to us.

At the same time, such a strategy would not preclude the parallel or later publication of popular articles or a popular book, or of more detailed and focused scientific articles.

Comments on the goals of the forthcoming voyage.....

Ben Finney     January 2, 1985

I see the voyage as being driven by the related goals of culture re-learning and research.     Let me explain.

#### I. CULTURE RE-LEARNING

Re-learn the ancestral maritime tradition by sailing Hokule'a over traditional routes and navigating her by traditional means.

So far many people have sailed Hokule'a on long voyages, and much has been learned about traditional sailing and navigation as well as the prehistory of Polynesia from these voyages. However, the dissemination of what has been learned has been limited. One object of the forthcoming voyage should be to widen the hands-on learning process by involving more people, and by multiplying their re-learning experiences after the voyage is over.

1) In particular, a larger group of people should formally study and practise traditional navigation. For example, there should be at least several dedicated Hawaiian apprentices, as well as apprentices from other islands. For example, Mau's son, or other Satawal Islanders studying under Mau, could be included, not only to widen their own experiences but to have others see how they learn.

2) Aptitude and motivation to sail and navigate should remain primary criteria for selecting candidates. However, attention should also be paid to the interest and ability of candidates to share formally what they have learned once they are back home. In other words, recruit some schoolteachers and others who are in a position to teach.

3) A plan should be developed for the formal dissemination of sailing and navigational knowledge learned on the voyage. In addition to formal publications, this could, for example, include a procedure for having those who have learned at least some navigation to help prepare school materials, and serve as resource persons, for teaching school children such facets of traditional navigation as the star compass or the identification of landfinding birds.

## II. RESEARCH

The two voyages that Hokule'a has made to Tahiti and return have shed much light on the capacity of double-canoes to make long voyages across the trade winds, and on how traditional methods can be used to navigate accurately over long distances. Yet, much more remains to be learned about traditional sailing and navigation. For example:

- 1) Some voyages along the Polynesian migration route were made against the direction of the prevailing winds and currents. The crossing from Western Polynesia (probably from Samoa or Tonga, or both) to central Eastern Polynesian centers such as the Marquesas, Tahiti or the Cooks must have been difficult for the trades blow from east to west in these latitudes. Would it be possible to tack a canoe against the trades to make this crossing, or is it necessary to wait for a seasonal wind shift to go from west to east?
- 2) We have a good idea about how traditional navigators use observations of the stars, the wind and swells to set their course and steer, just as we have abundant information on how they used clues provided by cloud effects, disruptions in the swell pattern and the flight of certain birds to help them make their landfall. However, although we have an idea of their

method of dead reckoning, we really cannot say exactly how they integrate their estimates of course and distance made good with information derived from star observations and clues provided by the marine environment to be able to so accurately plot their progress toward the target island, and to make any necessary course corrections.

The forthcoming voyage of Hokule'a would be ideal for investigating these and other questions about Polynesian voyaging and traditional navigation. We have a seasoned canoe, a cadre of experienced sailors and the drive to explore.

### III. RELEARNING AND RESEARCH

I see the effort for cultural re-learning and attempts to answer specific research questions as parts of the whole. For example, in navigation Mau is the prime teacher, Nainoa the star pupil. Rather than separate the two, as was done in the 1980 voyage for purposes of testing Nainoa's skills, have them work closely together on the forthcoming voyage. Let Nainoa probe deeply into Mau's methods, both to enhance his own skill as a navigator and also to document, for the scientific record, exactly how Mau is able to perform his navigational feats. Let this experience be as open as possible, so that novice navigators can share some of it, and so that some of it can be filmed and taped for replay to a wider audience.

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Comments on the '85-'87 Hokule'a research program:

We need to emphasize the point that we are not trying to recreate an ancient voyaging experience. We have, instead, chosen some specific, limited, and ATTAINABLE objectives, which can give us a much better understanding of the accomplishments of the ancient voyagers.

For our navigation research, taken by itself, it does not matter that the Hokule'a has modern construction. It doesn't really even have to be the Hokule'a; non-instrumental navigation can be used on vessels of any type. The Carolinian navigator Hippour easily made the transition from his traditional canoes to the modern yacht Isbjorn, for example, as described in David Lewis's important book, "We, the Navigators." Closer to home, Mau Piailug was able easily to transfer his skills to the Hokule'a -- a type of vessel with which neither he nor anyone else alive had any experience -- and to apply them in a totally unfamiliar part of the Pacific. Navigation depends on the stars, the winds, the sea, and the navigator; not on the boat.

A second goal of the Hokule'a's voyages is to demonstrate the sailing characteristics of this form of hull and rig. The shape and weight of the hulls are important, and for the Hokule'a these are designed to approximate a traditionally built canoe. It doesn't matter whether the actual construction is dugout wood, laminated ply, glass fiber, metal, or even cement; the water responds to the shape and weight of a hull moving through it, not to the substance of which the hull is made. In a similar way, the wind drives a boat through the shape of the sails, not the material out of which they are sewn.

We do not mean to imply that research trials of traditional canoe construction and materials would not be interesting and important. They would be, and we strongly encourage any such efforts. The Polynesian Voyaging Society is not doing such studies at the present time, however, because they are not critical to our specific goals.

Finally, we need to stress that the safety of the crew is all-important. None of our goals is worth the life of anyone aboard; these voyages are studies, not stunts. We will carry any modern backup instrumentation and equipment we consider essential to guarantee the safety of the canoe at all times. If anyone feels that we are not serious enough in our work to make sure that the navigation research is not compromised by safety considerations, so be it; there would be no way to satisfy such doubters. The critics do not have their lives, or the lives of friends and family, depending on their decisions.

5-3085  
Dixon Strong

March 24, Monday Research Committee

Ben, Dixon, Pinky, Nainoa

Purpose: review & refine research goals  
the film to take place  
in regards to research. What do we  
ask KHET to document?

Dixon: diff / extent  
started to get just got  
portions. Do some of these  
things & apply it. Mau/Nainoa.

Ben: You learn @ Mau

Nainoa: Not to learning

learning more by doing some valuable  
questionable. Learning of island  
diff. re: Rautonga. Response:  
very uncomfortable.

Course / hearing / distance - you have  
to know



Been drinking a great deal. The question  
needs to be addressed. Honest

- 1) ~~is~~ out of context magical
- 2) He is to know if his role is
- 3) Directed / focused 2 if he  
can contribute

Gets diff. N's lead becomes  
questionable. More info where he  
is not willing to have

Dixon: Were there cases of diff. opinion?

Yes - 1st reg only. That's  
my decision

Ben: ~~He~~ contributed to his alcoholism

Pinky: We ☒ aggravated it,  
but not caused it.

As an extension of his life. more booze  
here. We exposed it, we aid it now.

More diff. for Nixon

even now - avoid / picture -  
cause / know

Monday, March 24 Research Committee

Members Present: Ben Finney, Dixon Shoup,  
Pintley Thompson, Nainoa Thompson

The purpose of the meeting was to refine  
and review the research goals,  
which include the documentation by  
Hawaii Public Television.

In the early stages of <sup>creating</sup> the research  
goals, it was recommended  
that we (PVS) increase our <sup>orientation</sup> knowledge in <sup>by of sources, etc.</sup> stakefending,  
having Nainoa + Mau work together  
and to develop methods of precise  
communication w/ Mau so that we can  
get as close to his way of thinking  
as possible.

The above goal has worked to some  
extent but w/ difficulty. The difficulty  
has shown in areas of

a) It becomes difficult for Nainoa  
when leadership becomes questionable

b) His problem w/ alcohol,  
which has caused limited what  
he can contribute, or what he take  
in additional information.

Members present: Ben Thompson, Brian Strong,  
Murray Thompson, Margaret Thompson

The purpose of the meeting was to refine  
and discuss the business plan.  
which includes the business plan by  
Howard Public Television.

At the early stage of the business  
plan, it was determined  
that we (PVS) require the  
knowledge in that business, by  
having Norman + Brian work together  
and to develop methods of  
communication to them so that we can  
get as close to his way of  
thinking as possible.

The above plan has worked to some  
extent but with difficulty. The difficulty  
has shown in the form of  
of it becomes difficult for Norman  
when leadership becomes questionable

Page 2

Pinky  
Testimony - Suicide high in Micronesia  
educated in U.S.

I am worried about this. Are we  
contributing:

- 1) Its obvious we can learn
- 2) But we can't cut on him
- 3) Cut on him - navigating him home
- 4) running out of \$

1. Possi Mail finishing NZ/Samoa
2. helpful in reg water storms, finding sm. islands
3. Contributing more to his alcohol

Ben: Does not seem possible for learning  
atak system. We don't learn C about  
about Mau.

Do what you can 2 him & learn  
as much as you can now  
Ideally 1st learn the language  
maybe not possible outside this  
trade area.

Time scale not working out.

Nai Can't go back & reconstruct, just don't have the time. General

April 16 —

Our <sup>done</sup> stuff in 2 days w/ Will manual.

Hnl to Tahiti - more confusing

Tahiti to Rarotonga - will be on now.

Will - Best on land falling

Bon - Pick up weather conditions

Dixon - 3 trips considered - handling

unusual & conditions

Steering out ships

Island bloc - it could be dodges

NO east trade

For east trade

doldrums

April 1 - Will/Naiwa

3]

Then Nainor will work w/ Bernie.

(3 Copies of H-Treen)

Question: Putting an anthology together

- 1) Idea major anthology
- 2) Journal of P. S.
- 3) L. H. S. Project. ~~set to~~ go along w/ exhibit kind of ~~anthology~~ more popular level.

(September exhibit open)

Antho more professional - then deal with it ~~circle it~~ Positions mapped out

Under name / Voyaging - ~~Commonality~~ route map.

L.H.S. - more popular 1st contact  
w/ Polyn Voyaging: 100 pages  
Still in formal stages

[2]

Rainos - look at it as broad (wide)  
docu of our efforts relate  
to Poly Seaf. & Reales  
if document & record what  
happened on these legs

Need to tie to a more nat'l  
Techn audience - migr routes  
C needs to be explained

Currently reviewed by a biologist

Records of what happened to all  
legs. relate to Geography & Soc

Chance of Polynesia / P.S.  
designed & actually  
happened.

That is our at.  
it is act. do it.



4]

L.N.S.

Ben: diff vpt. do a book &  
voyage in narrative -  
impossible. What is missing JPS. -

Cultural impact reception of the people  
There is room for a coffee table  
book. Route maps, cheap  
retail. Pictures of a narrative

inset essays 2 Proffes. on  
particular pts. Pick it up  
anywhere. Binds.

Capture Trip w/out narrative.  
Hard to Capt & just words.

Words & pictures. For the record

Main intro / end up  
what we learned in JPS.



What we find out can be used  
by archaeologists.

- Aim for Pacific Audience  
Cultural

Don't see it as a money maker.

Get info &  
KHET: Also Cultural stuff  
has to be cultural interactions  
relate

- Use of jib percentage of time it was  
used & unless used for  
safety. needs to be systematically  
logged. Some of it is in the  
logbook. Try to log it at least

Voyage a bit fast, but smooth,  
Garden sail

Maybe out joining ancient  
canal

Take our C, ext. C.

Huai, slow. given

3)  
Ch. #9 - wants to put together  
for half presentation to  
perform in ref. for documentation.

Rainor - Nothing significant.  
Need a leg for a real traditional  
purpose.

Beets to do legs which is what  
at more significance  
Shooting script

KGBB - is a small group  
of people that are  
trying to put a  
man in the  
time

Big book  
pages of names  
of the

wind conditions - ball park voyage.  
Will go over before we put in.

Narrow  
Somewhat experimental - could in light air. part of the trip.

N<sup>o</sup> Calibre of sailor on board - efficient (Piece of equip. used in case of safety)

Perf of course & it is - it did factors of go, that of miles leadership, try to do all the time optimum.

ordered job  
because of safety.  
IN this sq.

6)

Writers for next leg:

Paul Viti

Mark Markwich

Smithsonian

Poss. for small size video presentation  
to be shown in Ulaikiki.

Planetarium / B.M.<sup>2</sup> portable basis  
RHS. If when canoe comes back put  
it on roof - \$65,000  
Small exhibit - supplement  
that, correct info on sailing.

Painoa - talked to meteorology.

Temp. getting cold.

move leg one week up.  
because of weather. 21 Climatology  
20th of April ideal, but  
at 11 it's happening now early  
winter. Longer you stay in  
N.3.

POLYNESIAN VOYAGING SOCIETY

MEMO TO RESEARCH COMMITTEE MEMBERS

FROM: NAINOA THOMPSON

RE: DOCUMENTATION

Using the Prehistory of Polynesia as a basic resource, our sailing project can complement its research by our own research which would document what it doesn't: the character of the mind and the potential of the abilities of the early Polynesian seafarers.

THE PREHISTORY OF POLYNESIA, edited by Jesse D. Jennings states on its cover flap:

"More than three thousand years ago incredibly skilled navigators from Southeast Asia began their voyages of discovery to the Polynesian Islands.

Settling there, they developed a distinctive and complex culture. In the past two decades archeologists and anthropologists have succeeded in reconstructing the course of those voyages and the emergence of a Polynesian culture. In this volume an outstanding group of scholars takes the story of Polynesia from its origins near the eastern tip of New Guinea to the first encounter with Europeans, just two hundred years ago.

The reality of the islands' prehistory is far more exciting than the romantic fictions that have been concocted about it. In probing the Polynesian past, the scientists writing here have used not only sophisticated archeological techniques but such adventurous methods as building a Hawaiian double-hull canoe and sailing it, with only the ancient navigational aids, across nearly 4,000 kilometers of open ocean to Tahiti.

The focus of the book moves chronologically from the early Lapitan villages to Fiji, Samoa/Tonga, the Marquesas, Easter Island, Hawaii, the Societies and New Zealand. Further chapters explore the evidence provided by studies of the contemporary Polynesians and their environment: linguistic, biological, ecological, and navigational. A final chapter on the Melanesian background extends the chronology to earlier times.

The contributors are an international group of experts on Polynesian archeology, and anthropology. The editor, Jesse D. Jennings, is Distinguished Professor of Anthropology at the University of Utah."

The following is excerpted from the Introduction:

"For over two centuries the islands of the Pacific have been objects of curiosity and study because of a perennial romantic interest in the origins of their beautiful people. Thanks to radiocarbon dating and the discovery of Lapita pottery, there has been great progress in our understanding of these islands, their history, the mode of their settlement, and the close relationships among them. In addition to the changes in ideas that have come in the past decades or two because of the increasing number of young scholars at work in the area, there are hundreds of laymen who have a serious interest in the peoples of the Pacific and their history; yet there has been no

organized presentation of findings. The Prehistory of Polynesia is an outgrowth of such diverse factors as recognized need, increasing knowledge, greater coherence of that knowledge, and the exciting long history (3,000 years or more) of Polynesian settlement during which the islands were discovered and colonized by Southeast Asians.

"...At the invitation of the Harvard University Press, I undertook to assemble a group of scholars knowledgeable in one aspect or another of Polynesian archeology, or in such areas as linguistics, agriculture, or physical type. I invited the individuals whose chapters follow to join me in the preparation of a book that would be written simply, as free of jargon as possible, to serve as an introductory text for undergraduate students and perhaps as a guide for use in graduate seminars. It ought also serve to introduce the lay reader to the entire field.

"...The arrangement of the chapters is entirely chronological, based on the time of the first discovery of an island chain by the founder population. Pioneer explorers called Lapita, from Southeast Island Asia (specifically off the eastern tip of New Guinea), reached both Tonga and Samoa by 1000 b.c. The first eastward movement farther into the Pacific is recorded for the Marquesas by a.d. 300. Thence went two groups, one to Easter Island by a.d. 400 and the other to Hawaii by a.d. 500. It is possible that another group went to the Societies shortly after their arrival in the Marquesas, but that thrust has not been proved. Certainly, a second movement to Tahiti (the Societies) occurred by a.d. 600 and from there to New Zealand by a.d. 800. Secondary dispersals from Tahiti to Hawaii and New Zealand after a.d. 1000 are possible but debated. These migrations are charted in Fig. I.1, from the dates established by radiocarbon assays provided by the contributors to this volume; the times, sequences, and directions of the spread of Polynesian culture over the Pacific are indicated.

"The chapters in this book that summarize the archeology of the region are arranged accordingly with the Lapita complex first; following it come Fiji, Samoa and Tonga, the Marquesas, Easter Island, Hawaii, the Societies and finally, New Zealand. The second cluster of chapters is a series of topical treatments in no particular order. In general, they represent new trends in archeological research. The final chapter is a summary of the archaeological knowledge of Melanesia."

#### Contents

Introduction  
The Oceanic Context  
Lapita  
Fiji  
Samoa and Tonga  
The Marquesas  
Easter Island  
Hawaii  
The Societies  
New Zealand  
Language  
Physical Anthropology  
Subsistence and Ecology  
Settlement Patterns  
Voyaging

Jesse D. Jennings  
Peter S. Bellwood  
Roger C. Green  
Everett L. Frost  
Janet M. Davidson  
Yoshiko H. Sinoto  
Patrick C. McCoy  
H. David Tuggle  
Kenneth P. Emory  
Janet M. Davidson  
Ross Clark  
William Howells  
Patrick V. Kirch  
Peter S. Bellwood  
Ben R. Finney

Melanesia  
Epilogue

J. Peter White  
Jesse D. Jennings"

The book speaks for itself. A group of scholars tops in their fields have put together what I consider the most up to date and thorough document of Polynesian history, at least from the context or point of view of the sciences of archeology, anthropology and linguistics. This book could be an important piece of work for us as long as we can accept the validity of such sciences. This would be used as a frame work or foundation for our research efforts. The viewpoint of these individuals tell where the Polynesians came from and what they did to the islands once they reached the new islands. I feel we should use such a foundation to tell another story, that being of the journeys between the islands. We should direct our efforts more into the character of mind of the Polynesian seafarers, their skills and abilities.

I think we should focus our theme in terms of answering as best as possible Cook's question of: "How do you account for the presence of such a nation?"

We should develop a context, a design, a certain approach to answering such a question with solid research.

What I know we have is:

A. Information that is already available to us -

- 1) geography of the Pacific
- 2) climactic information
- 3) oceanographic information

We have a good understanding of the natural environment of Polynesia which is essential to understanding these seafaring accomplishments.

B. A canoe -

The vehicle into the experimental archaeology, the vehicle that can take us to the ocean as if into the past. We can test Hokule'a's:

- ... sail capabilities
- ... certain artifacts, sennit rope, lauhala sails, native woods, etc.

Remember, this is a long voyage. We can do small experiments one test at a time.

C. Mau Piailug -

Our teacher to the past, a man who can direct us to portions of the past we seek.

D. A good crew -

10 years old, we have more experience in more individuals prepared to complete such a task.

E. A navigational foundation of knowledge, memory for testing.

With such resources and abilities, I feel we are very ready to research the character of mind and potential of the abilities of the

early Polynesian seafarers. At the same time our effort can only complement the works of the Prehistory of Polynesia as it could only complement ours.

I think it may be wise to contact Jesse Jennings for advice. .

10-30-84



RESEARCH DEVELOPMENT MEETING - MINUTES

Tuesday, October 30, 1984  
Hawaii Public Television

Present: Leonard Mason, Dixon Stroup, Kenneth Emory,  
Tom Coffman, Chris Conybeare, Will Kyselka,  
Lee Kyselka, Laura Thompson, M. Among

The purpose of the meeting was to define and expand on the areas of research/documentation for the 1985 voyage.

Discussion centered on the possibility of working the science-related question of navigation and canoe performance to include also history, anthropology, documentary journalism, and the arts with one area feeding the other.

After much discussion, the following recommendations were made:

- (1) The Hokule'a should have an onboard documentation person. This individual should be salaried. He/she would be responsible for writing the story of the voyage which would include the social interaction of the crew on sea and land, the documentation of the navigator, gathering all the oral material and photographic material. This individual would then feed the tapes and visuals to the proper individuals.
- (2) The crew members should also participate as documenters. This can be done through a training orientation program before the Hokule'a departs. To be sensitive and knowledgeable when interacting with the visiting peoples, each crew member should be briefed as to the history, culture, and protocol of their island destination.
- (3) Prior to the voyage, a team should be sent ahead to make contact with the appropriate groups and individuals.
- (4) A forum should be held before the voyage, which would discuss the voyage, its purposes and destinations.
- (5) During the voyage, small conferences should be held. A forum at the end of the voyage should also be scheduled which would include scientists, humanists, educators, cultural resource people, media and the community.

Page Two  
RESEARCH DEVELOPMENT MEETING - MINUTES  
Tuesday, October 30, 1984

A memo was distributed from Nainoa Thompson which recommended the use of PREHISTORY OF POLYNESIA as a basic resource to which our sailing project can complement its research by what it does not document: the character of the mind and the potential of the abilities of the early Polynesian seafarers.

He suggests that we focus our theme in terms of answering as best as possible Cook's question: "How do you account for the presence of such a nation?", by developing a context, a design, a certain approach to answering such a question with solid research.

Dr. Ben Young and Leinaala Heine could not attend the meeting because of prior commitments. Dr. Young will contact Marlene when he returns from Chicago to discuss possible avenues of research.

The next meeting will be scheduled at a later date.

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RESEARCH COMMITTEE MEETING - MINUTES

Monday, October 22, 1984  
Hawaii Public Television

Present: Chris Canybeare, Dixon Stroup, Laura Thompson  
Will Kyselka, Mar Among

The purpose of the meeting was to discuss the status of the research committee.

Dixon informed the group that he has been in contact with Nainoa and they will begin working on the documentation for the 1980 voyage. He also stressed that his efforts in the documentation for the 1985 voyage will be concentrated in the areas of navigation and canoe performance. (See detailed report submitted July 1984).

Will Kyselka discussed integrating information from culture and science into a comprehending relationship. The disciplines of philosophy, religion, and history provide a base for looking at the findings in archaeology, anthropology, botany and linguistics.

It was agreed that others should be contacted to assist in defining what other areas can be documented, and this initial meeting should be small. The following individuals will be contacted: Dr. Kenneth Emory, Dr. Benjamin Young, Dr. Leonard Mason, Leinaala Heine, Emily Hawkins.

The next meeting was scheduled for Tuesday, October 30, 2:00 P.M. at Hawaii Public Television.

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#### HOKULE'A DOCUMENTATION '85

The documentation effort for the '85 voyage has two major divisions. One of these I think of as 'soft' documentation, in the sense that it involves pictorial and descriptive material more than numerical data. The primary goal will be one or more TV/film documentaries on the voyage, including training and other preparation.

This can be an exceedingly valuable product of the PVS '85 effort. The success in this area will depend entirely on the talents of the people chosen to do the work; it is so far outside my own area of competence that I hardly feel qualified to comment. It seems clear that the navigator and the captain should be the primary consultants.

The second major division is the 'hard' documentation, which is itself split into two sub-divisions - navigation and canoe performance. (These sub-divisions of course overlap to some extent.)

Navigation Documentation - Basically, we want to repeat what was done on the '80 trip, but (based on that experience) to do it more thoroughly and more efficiently.

The goal is to allow the navigator, in his post-voyage analysis, to recall all reasons behind his estimates and the basis for his decisions; that is, to be able to re-create (and describe for others) the whole process of navigation. To do this, we need to record his observations (sun, moon, stars, wind, waves, course and speed, etc.); his thoughts (relation to reference course; expected current set; anticipated changes in weather or current and their effect on the present course; etc.); and, of course, his position estimates.

These records will again be done in a regular taped interview format, with standardized questions plus opportunity for unlimited comments.

At the same time, of course, the ARGOS beacon (together with navigation data from the escort) will provide an accurate record of the canoe's true track.

Canoe Performance Documentation - Performance data were not previously collected in any regular manner, so this will largely be a new effort. The goal is to provide accurate data on the sailing ability (especially, the upwind sailing ability) of the canoe over long distances, in a seaway, while fully loaded for voyaging.

- 2 -

Standard information should include true wind, relative wind, canoe heading and speed, wave and swell direction, period, and height, sail adjustment, steering method, canoe trim, leeway estimates, etc. Several of these items will require simple (non-electronic) instrumentation aboard the canoe.

Someone other than the navigator should take the main burden of these observations, but such items as wind and waves should be cross-checked with the navigator's observations.

Note that the escort vessel should be equipped (instrumentation plus trained personnel) to make the full suite of standard marine meteorological observations on a regular basis.

Dixon Stroup  
July '84

Comments on the '85-'87 Hokule'a research program:

We need to emphasize the point that we are not trying to recreate an ancient voyaging experience. We have, instead, chosen some specific, limited, and ATTAINABLE objectives, which can give us a much better understanding of the accomplishments of the ancient voyagers.

For our navigation research, taken by itself, it does not matter that the Hokule'a has modern construction. It doesn't really even have to be the Hokule'a; non-instrumental navigation can be used on vessels of any type. The Carolinian navigator Hipour easily made the transition from his traditional canoes to the modern yacht Isbjorn, for example, as described in David Lewis's important book, "We, the Navigators." Closer to home, Mau Piailug was able easily to transfer his skills to the Hokule'a -- a type of vessel with which neither he nor anyone else alive had any experience -- and to apply them in a totally unfamiliar part of the Pacific. Navigation depends on the stars, the winds, the sea, and the navigator; not on the boat.

A second goal of the Hokule'a's voyages is to demonstrate the sailing characteristics of this form of hull and rig. The shape and weight of the hulls are important, and for the Hokule'a these are designed to approximate a traditionally built canoe. It doesn't matter whether the actual construction is dugout wood, laminated ply, glass fiber, metal, or even cement; the water responds to the shape and weight of a hull moving through it, not to the substance of which the hull is made. In a similar way, the wind drives a boat through the shape of the sails, not the material out of which they are sewn.

We do not mean to imply that research trials of traditional canoe construction and materials would not be interesting and important. They would be, and we strongly encourage any such efforts. The Polynesian Voyaging Society is not doing such studies at the present time, however, because they are not critical to our specific goals.

Finally, we need to stress that the safety of the crew is all-important. None of our goals is worth the life of anyone aboard; these voyages are studies, not stunts. We will carry any modern backup instrumentation and equipment we consider essential to guarantee the safety of the canoe at all times. If anyone feels that we are not serious enough in our work to make sure that the navigation research is not compromised by safety considerations, so be it; there would be no way to satisfy such doubters. The critics do not have their lives, or the lives of friends and family, depending on their decisions.

5-3085  
Dixon Strong

3 October 1985  
page 1/3

TO: PVS Board of Directors  
FROM: E.D. Stroup, Navigation Research Committee  
SUBJ: (1) ARGOS PTT beacon  
(2) OCEANUS article  
(3) Navigation Research Committee chairmanship

(1)

We have been offered the loan of an ARGOS PTT for the Cooks-N. Z. test; the instrument will be available when the U. of Washington vessel "Researcher" arrives here about 20 October. Processing of position data will be provided by their project.

The loan is offered under the following conditions: they need to re-deploy their buoys early in 1986, so we will have to agree to return the PTT as soon as Hokuie'a reaches New Zealand, and we have to guarantee them a replacement unit if the one we have is lost or damaged. We can use the period between now and the canoe's departure from New Zealand to purchase a PTT of our own; the U.W. group has offered to continue to process the data for us free of charge. I require the Board's approval to make the above guarantees, and to move ahead with purchase of a new PTT; the price of an individual unit is about \$2,000 (batteries and other incidentals will add only a small amount to this).

It is important to be aware that the ARGOS system is not vital to the mission, even for safety. If you think of a man holding up his pants with a belt plus suspenders, then for more safety he adds thumbtacks, the ARGOS system would be like him adding adhesive tape on top of everything else.

The primary safety is provided by the escort. Keep in mind that they will be traversing little-travelled parts of the ocean; if trouble comes, it's not like being in the North Pacific or North Atlantic, with extensive long-range search and rescue capability readily available from the U.S. Coast Guard and Navy, and with dozens of commercial ships crossing the region at any time. They must, repeat MUST, be prepared to rely on the escort for help.

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3 October 1985  
page 2/3

Secondary safety is provided by the long-range communication capability, and of course by the satellite-navigation receivers on both canoe and escort.

A third -- and extremely important -- level of safety is provided by the emergency beacons, which would be activated if there is no hope of self-rescue. These beacons ARE RECEIVED BY RUSSIAN AND AMERICAN SATELLITES; they do not require that aircraft be in the vicinity. A recent rescue in the North Pacific was triggered by such a device on a disabled sailing vessel. These emergency beacons are more valuable than the ARGOS beacon for safety, because there can be no question: if a beacon is activated, help is needed.

Note also that the ARGOS headquarters distinctly states that their system should NOT be relied on for primary safety; they disclaim responsibility for such use. The ARGOS function is position determination and data transmission, not rescue.

With regard to navigation data, the ARGOS system is not essential to our project as long as the sat-nav data are being recorded on board either vessel. (Note: remember that in 1980 the Ishka had no sat-nav system, and, as it turned out, the celestial navigation being done on the Ishka was extremely sketchy. The accuracy of the ARGOS system was a Godsend. For the present voyage, however, the sat-nav units aboard are approximately as good as the ARGOS system, so we would not gain anything in accuracy with ARGOS.) The only thing we would not have is the direct readout of position independent of the vessels; instead, we would have to get the positions from them by radio. This is an inconvenience, but would be possible to live with if we couldn't afford ARGOS.

(2)

The OCEANUS article should be out, but I haven't received any copies yet. Woods Hole Oceanographic Institution (the copyright holder) has given PVS a blanket OK to use the article in any way we want.

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3 October 1985  
page 3/3

(3)

I regret that I must resign from the Chairmanship of the Navigation Research Committee effective immediately. The Board should designate a new leader for this important project as soon as possible. Unless otherwise directed, I will continue with efforts to make the ARGOS arrangements until that situation is secure. I will continue to work with the project as an ordinary member of the committee if the new chairperson so requests.

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# MINISTRY of TRANSPORT

## NEW ZEALAND METEOROLOGICAL SERVICE

P.O. BOX 722, WELLINGTON 1  
TELEPHONE: 729 379  
TELEGRAMS: METEO  
TELEX: 31392

SALAMANCA ROAD,  
KELBURN,  
WELLINGTON 1

Met: 32/42/2

16 September 1985

Dr B. Kilonsky  
Hawaii Institute of Geophysics  
University of Hawaii  
2525 Correa Road  
Honolulu  
Hawaii 96822  
USA

Dear Dr Kilonsky

John Kidson has passed on to me your request for details of our marine broadcasts in connection with the proposed voyage of the Hokulea Polynesian Voyaging Society from Tahiti to New Zealand via Rarotonga.

Unfortunately the publication giving details of our marine broadcasts is being reprinted and is not available. However you will find attached pages which give details of the radio-telegraph and radio-facsimile broadcasts together with the associated frequencies. I have highlighted the broadcasts that should be relevant to your voyage.

I have also included a map showing the areas for which New Zealand provides warnings and forecasts. The eastern boundary was extended to 120° west from 1 September 1985. To the north of 25° south Nandi in Fiji provides warnings and forecasts for the area west of 140° west and these are broadcast from New Zealand. You will be able to obtain forecasts for the area east of 140° west from the radio station in Tahiti.

I hope you have a successful voyage, and please let us know if you require any further information.

Yours sincerely

A handwritten signature in cursive script, appearing to read 'A A Neale'.

A A Neale  
Chief Forecaster

# NEW ZEALAND MARINE WEATHER FORECAST AREAS

## OCEANIC



ILLEGIBLE

NEW ZEALAND METEOROLOGICAL SERVICE  
RADIO FACSIMILE SCHEDULE EFFECTIVE FROM 0000 11 SEPTEMBER 1965  
ALL TIMES - GMT

PRODUCT	MAP	TX TIMES	PRODUCT	MAP	TX TIMES
SIGWX PROG VALID 1200	NREG	0000-0015	SIGWX PROG VALID 0000	NREG	1200-1215
SEA SWELL FCST VALID 0000/1800	NZ	0015-0030	0600 250 HPA ANAL	NREG	1300-1315
250 HPA PROG VALID 1200, H24	EPAC	0030-0045	250 HPA PROG VALID 0000, H24	NREG	1315-1330
700 HPA PROG VALID 1800, H30	NREG	0045-0100	1200 MSL ANAL	TNZ	1500-1515
1900 250 HPA ANAL	NREG	0100-0115	SIGWX PROG VALID 0000	NPAC	1515-1530
250 HPA PROG VALID 1200, H24	NREG	0115-0130	MSL PROG VALID 1200, H24	SWP	1600-1615
0000 MSL ANAL	TNZ	0300-0315	SIGWX PROG VALID 0000	ASIA	1615-1630
SIGWX PROG VALID 1200	NPAC	0315-0330	1200 MSL ANAL	SWP	1630-1645
SIGWX PROG VALID 1200	ASIA	0400-0415	SEA SWELL FCST VALID 1800/1200	NZ	1745-1800
0000 MSL ANAL	SWP	0430-0445	1200 500 HPA ANAL	NREG	1815-1830
FAX SCHED		0445-0500	SIGWX PROG VALID 0600	NREG	1845-1900
SEA SWELL FCST VALID 0600/2000	NZ	0545-0600	1200 250 HPA ANAL	NREG	1900-1915
SIGWX PROG VALID 1800	NREG	0600-0615	250 HPA PROG VALID 0600, H30	NREG	1930-1945
0000 500 HPA ANAL	NREG	0615-0630	500 HPA PROG VALID 1200, H24	NREG	2000-2015
0000 250 HPA ANAL	NREG	0700-0715	250 HPA PROG VALID 1200, H24	NPAC	2015-2030
250 HPA PROG VALID 1800, H30	NREG	0730-0745	250 HPA PROG VALID 1800, H30	NPAC	2030-2045
500 HPA PROG VALID 0000, H24	NREG	0800-0815	SEA SFC TEMP ANAL, (MON & WED)	NZ	2045-2100
250 HPA PROG VALID 0000, H24	NPAC	0815-0830	1600 MSL ANAL	TNZ	2100-2115
250 HPA PROG VALID 0600, H30	NPAC	0830-0845	SIGWX PROG VALID 0600	NPAC	2115-2130
0600 MSL ANAL	TNZ	0900-0915	ML WMC 1200 MSL SOUTH PAC ANAL	SPC	2145-2200
SIGWX PROG VALID 1800	NPAC	0915-0930	SIGWX PROG VALID 0600	ASIA	2200-2215
FL WMC 0000 MSL SOUTH PAC ANAL	SPC	0945-1000	700 HPA PROG VALID 1200, H24	NREG	2215-2230
700 HPA PROG VALID 0000, H24	NREG	1000-1015	1800 MSL ANAL	SWP	2230-2245
500 HPA PROG VALID 0600, H30	NREG	1015-1030	500 HPA PROG VALID 1800, H30	NREG	2245-2300
0600 MSL ANAL	SWP	1030-1045	SIGWX PROG VALID 1200	EPAC	2300-2315
700 HPA PROG VALID 0600, H30	NREG	1045-1100	MSL MAR WX PROG VALID 0600, (A)	SWP	2315-2330
SIGWX PROG VALID 1800	ASIA	1100-1115	MSL MAR WX PROG VALID 0600, (B)	SWP	2330-2345
MSL MAR WX PROG VALID 1800, (A)	SWP	1115-1130	MSL PROG VALID 0000, H30	SWP	2345-2400
MSL MAR WX PROG VALID 1800, (B)	SWP	1130-1145			

NOTES:

CHART (A) CONTAINS ELEMENTS OF THE MEAN SEA LEVEL PROGNOSIS, AREAS OF POOR VISIBILITY AND THE EDGE OF THE FIXED ICE.  
CHART (B) CONTAINS INFORMATION ON THE AREAS OF HIGH WINDS AND HEAVY SWELL.

ONE (1) HECTOPASCAL (HPA) = ONE (1) MILLIBAR (MB).

BROADCAST FREQUENCIES 16220-16230 KHZ 1800-2500 GMT, 13550KHZ 0000-2400 GMT, 9450KHZ 0000-2400 GMT, 5805KHZ 0600-1600 GMT

ILLEGIBLE

## MARINE WEATHER BROADCASTS

### RADIO-TELEGRAPH (RTG)

Contents of Broadcast	Time *		Call Signs and Frequencies (kHz)
	NZST	GMT	
WARNINGS: Wind force 8 to 12, SW Pacific; Equator-55°S, 160°E-140°W	0200	1400	
ANALYSIS: 20°S-55°S, 140°E-140°W; IAC Fleet Code	0600	1800	
WARNINGS, SITUATION and COASTAL FORECASTS: (18 hrs), out to about 30 miles from New Zealand coastline, outlook for further 18 hours	0805	2005	
WARNINGS: Equator-55°S, 160°E-140°W; SITUATION and FORECASTS (30 hours): 25°S-55°S, 150°E-140°W divided into areas: Tasman, Northern, and Southern; and reports in code from ships and land stations in temperate latitudes.	0845	2045	
WARNINGS, SITUATION and FORECASTS (24 hours): Equator-25°S, 160°E-140°W; and reports in code from ship and land stations in tropical latitudes, followed by additional ship reports from temperate latitudes	0920	2120	
WARNINGS: Equator-55°S, 160°E-140°W	1400	0200	
ANALYSIS: 20°S-55°S, 140°E-140°W; IAC Fleet Code	1700	0500	
ANALYSIS: Equator-25°S, 155°E-140°W; IAC Fleet Code	1720	0520	
WARNINGS, SITUATION and COASTAL FORECASTS: (18 hrs), out to about 30 miles from New Zealand coastline, outlook for further 18 hours	2005	0805	
WARNINGS: Equator-55°S, 160°E-140°W; SITUATION and FORECASTS (30 hours): 25°S-55°S, 150°E-140°W divided into areas: Tasman, Northern, and Southern; and reports in code from ships and land stations in temperate latitudes.	2045	0845	
WARNINGS, SITUATION and FORECASTS (24 hours): Equator-25°S and 160°E-140°W; and reports in code from ships and land stations in tropical latitudes for areas Tasman, Northern and Southern	2120	0920	

ZLZ 20 : 5915  
ZLZ 22 : 7600  
ZLX 22 : 11130  
ZLX 37 : 14850  
ZLX 31 : 19488

DOCUMENTATION MEETING

Tuesday, June 11, 1985  
Hawaii Public Television  
9:00 A.M.

PRESENT: Nainoa Thompson, Will Kyselka, Dixon Stroup, Tai Crouch, Chris Conybeare, Joy Chong, M. Among

It was clarified that there would be three types of documentation:

- 1) Navigation and canoe performance
- 2) Popular writing for articles
- 3) Documentation by Hawaii Public Television (This will include the Lawrence Hall of Science requirements.)

The Hawaii to Tahiti leg, Tai Crouch will be responsible for the documentation of the navigation/canoe performance, popular writing, and HPT documentation requirements. Harry Ho will assist as a back-up, especially in the area of HPT documentation.

HPT will provide two (2) 16 mm cameras. One camera will be utilized on-board the Hokule'a. The other 16 mm camera will be kept on the escort vessel. The camera kept on the escort vessel will only be utilized if the camera on Hokule'a dysfunctions. Also, NO ONE is to use that camera unless they have been trained by the personnel at Hawaii Public Television. As of today's date, only Tai Crouch and Harry Ho have received training.

Two (2) Sony tape recorders will also be provided. They will be utilized by the navigation documentor, in this case, Tai Crouch for the Hawaii to Tahiti leg.

All equipment will have water-proof housing. Tai was reminded to slate each roll of film and to mark the boxes. Film will be provided for one hour of shooting.

Nainoa described the procedures for navigation documentation. Interviews will take place twice a day, sunrise and sunset. These interviews will not be tape recorded but logged, because it will comprise of raw data, such as course and wind speed.

The tape recorded interviews will take place every twelve hours. These tape recorded interviews will be more precise than 1980, but will include more information/data to make each day distinctive as to why certain navigational decisions were made.

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Page Two  
DOCUMENTATION MEETING  
Tuesday, June 11, 1985

Nainoa will obtain the forms used in logging the raw data from Harry Ho, and give them to Marlene for duplication on water-proof paper.

Tai Crouch brought up the point that in an emergency situation, such as a mast breaking, does he assist the crew or does he film the event.

Chris C. emphatically stated that the safety of the canoe and crew is of utmost importance than filming any event.

Nainoa stated that in an emergency situation, Tai should always check with Shorty first as to his role.

The escort vessel's involvement with documentation was discussed. At present, no qualified individual has been selected to do documentation on board the escort vessel. Individuals considered were James Akaka, Billy Richards, or Pauahi Ioane. (Peter and Sesario will definitely be on-board the escort vessel, but they are not qualified to collect the data.)

When appropriate, interaction between Mau, Nainoa and Shorty will also be documented both on film, paper, and recorder.

It was highly recommended that crew members on the first leg (Hawaii to Tahiti) should meet before departing to review responsibilities and roles of the crew members. A meeting was tentatively scheduled for Saturday, June 15, 4:00 P.M. at the Kyselka's home. Marlene will call Shorty to confirm.

It was also highly recommended that the roles of Captain, Watch Captain, Navigator, etc. should be written and kept on file.

67

Pinky

Here's the page my brother wrote up regarding escort vessels, based on his experiences aboard Polka. I think the board should adopt a policy in this area, whether based on Mike's thoughts or some other criteria.

Borden + Namoa should have a major input. The only thing I would add would be that PVS have written agreement that we can put (at least) one observer on the escort, with specific duties (weather observing, communication with canoe to avoid inadvertent transfer of position info, etc)

Sorry I couldn't make the last meeting — but I haven't seen Namoa anyway, and Dandy Fawcett hasn't returned my calls, so there's been damn little activity in the research front . . .

Dixon



### ESCORT VESSEL

In future it might be preferable to use a larger vessel, such as the 60 foot or so albacore boats that have a full complement of radar, electronic navigation, fresh water evaporators etc., on board. The additional expense might save headaches.

If a smaller motor-sailer is to be used the following should be considered, some of which will also apply to the use of a larger ship as well.

Some care should be taken to check out the abilities of the ship and her captain and crew. References should be solicited from different sources, especially from those who have sailed with her before.

The point should be forcefully and repeatedly made that escorting is much more difficult than sailing alone. There is more maneuvering, sail handling, laying to, and so on. And it may be necessary to work closely with the captain of the canoe in changing the cruise plan if circumstances warrant. Contingency plans for various emergencies should be worked out and put in writing as part of the sailing directions for both canoe and escort.

The two most obvious things to be checked on are sailing capabilities and navigation capabilities. The boat should have the capacity to do reasonably well in relation to the canoe--which does well in light air--under sail alone. She should have a full complement of sails including Genoa, whisker-poles, and spinnaker, and all the necessary gear to efficiently handle any sailing situation, including heaving-to with sea anchors. The boat should also have an electronic log, knot meter and wind speed and direction indicator on board. A depth indicator-recorder and radar would be helpful also, but not essential. The navigator should be familiar with working out sights on all celestial bodies, i.e., sun, moon, planets and stars. Other electronic navigation equipment would be helpful, even just an RDF.

Highly desirable would be at least a three day cruise with the canoe, out of sight of land, to train and test out the escort vessel, (and the canoe) under as many different circumstances as possible, strong winds, light winds, heave-to, towing, running under sail alone, taking navigation fixes and so on.

The boat should also have its own VHF radio on board. Other radios may be supplied as necessary, but the skipper should have some idea of proper radio procedures and be familiar with radio communications to some degree.

ARGOS DATA COLLECTION AND LOCATION  
SATELLITE SYSTEM

1985 TARIFF SCHEDULE

I--Standard Processing ("Type 1"):

182.00F/day

\$20/day approx.

This includes calculation of location, processes the data from the atmospheric pressure and temperature sensors (and responds to the emergency switch if it's on), generates data files which we can access by computer terminal, and archives the information for three months.

NOTE: We would need this only for time at sea. In VERY round numbers, putting in a large cushion for extra time because of weather, this might approach a total of \$4500 for the entire trip.

II--Distribution of Results:

Less than \$100 for printout listing and computer tape.

The daily updates on position will involve long-distance phone accessing of the data files on the East Coast; I haven't tried to add those in.

III--Equipment Rental (CML 80 N integrated mini weather station and ARGOS beacon, with distress alarm switch):

45,700F/180 days

\$4850/180 days approx.

This approaches \$10,000 each year. Note that shipping and insurance charges must be covered by PVS. Rental rates are also given for 45-, 90-, and 135-day periods; even at the higher basic rates for these shorter times, we might be able to gain by returning the unit during layovers. (This would certainly be true for the longest layover. The uncertainty of scheduling may make this difficult for many of the shorter layovers, however.)

Finally, note the possibility that State endorsement may allow a tariff reduction. This will be looked into.

Dixon Stroup

27 March '85  
exch. 1F = 8.106

10

Ben Linney, Gordon, Nainoa, Pinky -  
~~Linney~~ ~~Pro & cons~~

Review the new sail & get  
his mana'o.

- what was your thinking  
on the sail plan.

Part of to do & the  
is a year?

Push Nainoa to push  
it back to accomod 1985  
departure.

Nainoa - reviewed w/ his charts  
1) Goals. The canoe  
may Poly island groups.

2) Test with parti c's  
PPT has a frame.

3) Test the c's  
suggested it - 1st  
produced both ways.

2 imp <sup>1998</sup>  
~~Cook~~ <sup>Samoan</sup>

to C. Polynes

The idea of to all  
maj id groups.

Initially sail 2 H to C.P.  
center to Suamalus then  
Mangusa. 2 to  
target Suamalus, there  
waiting for winds - back  
to Mang. if "Easterly"

Then 2 down to  
Socetup.

NZ 2 Saluti 6 poss  
Ceng + archaeology

imp Cool - NZ then to Tonga,  
for Kenua  
Samoan (not 2-4  
Western)

if the winds are No of East. —  
East. Not a  
difficult thing to do.

The Sail Co — 6

avoiding  
1) Cyclone  
2) Sailing

desired wind

highest 3) 4) Aug,  
strong storms, but we  
can keep an eye on it.

To N.Z. — Jan/Feb/March

when tides are the best  
aim for the tip of No. Island.

B.I. — Norfolk Island find  
archae sites.

No. America — leave — deal  
Trace — die  
of become slaves — intimately nothing

"Great Maori Myth" ] - S. Percy Smith

(Tahiti/Raietonga<sup>2</sup> - great cultural excitement)

W2: going north Tonga sail  
in gales to avoid storms -  
doing it on instruments

May - go East

June/July - try to get S to  
the Cooks

Claus

Argument 2 B.F. + others:

you find if any E-W movement  
evidence. It argues for a  
westerly wind reversal.

That's what he believes.

1) It explains why I got  
2) I had a constant  
flow.

3) Maori El Niño.

4) If n/10 to deepi  
seat -  
put you at risk.

This is a dilemma.

\* (West <sup>as hypo.</sup> - west reversal not  
tackling.)

D - Safety Jr  
than K. to duplicate <sup>event</sup> P.

F - Jim Sears attempt, o. a  
✓ sailor.

Moorea → 2 E. <sup>South</sup> Polynesia.

F - J. n. 2 in Tahiti - Cooks -

F. Photo credit on purpose

Tahiti - Society, Raro - Rarotonga

Tahiti / C / NZ + S (mystical)

all  
Finney

H - Tahiti - 6 1/2 argue

he E + W Polyn - 2 1/2  
qui forth

best CP (in 20's) to Easter Is + to  
I know dubious.

Best dist - H/T

pos 2 way  
feasible

(No Cooks) Puka Samoa (tip)  
quoted in Lewis

most 1 yr seed

limited 2-way voy

Shaky ground

NZ - Cooks - Tahiti - Very hard  
trip



2 way <sup>vegas</sup> ~~cross~~ to N. Zealand hand  
some our best relevant & 2 our  
hol

Fr. Central issue  
1) Cultural - to the   
in Poly  
2) quasi research -  
anthropological

What is the most basic  
you 2 to do.  
Res + Cultural part  
separately  
<sup>integrated</sup>  
CEP - to NZ relevant  
W-EP - irrelevant

J-Marg - interesting

~~What's the~~  
dichae - May 1st.  
left diff in temp doesn't  
(Buco Buco - (Maori temp))

Marg sorted 1st. Then Saki (poor  
Luemotus) (Hawo. is was  
to be the biggest  
chief)

High islands settled, then  
low islands - then relations  
trade, etc.

Trade, etc.

Mar. 17

Sail to

2 Luas to way.

P:-

✓ / Secret - i.e. 9  
route / suggest?

F:

Eastern  
Central

to N.3 -

Then the trip over -

West to East Polynesia

interesting

wait

Wobblers

fair if

if all can talk.

Explore

hypo

always be a

hull

you

a f-glass

2)

where a

gaeng

Finney suggested ( )  
Scientific:

to Eastern Central Polynesia  
to New Zealand  
Then the trip over  
West to Eastern Polynesia.

Dixon: ✓ of value  
upwind ability of  
Hokule'a - is the canoe  
can do 2, 3 distance  
upwind. Apple  
to find patterns.

F: 1) to know ✓ the  
true wind is ✓ all  
the time.

2) And measure your current.

main ideas:

So & so suggested @  
the migration route were:

Evidence shows. Thus

Nainoa: avoid hurricane season  
don't want to Eastward sail.

took canoe to Kauai +  
wait, for kona wind  
Finnian Janyal took told Cook  
that already.  
too dangerous.

That's in you explain  
the settlement of  
the Marquesas Islands.

CP - Samoa, Tonga, Fiji

UP Culture C into up in Mang.

Must just +  
rebelant

1) CEP T=C-to NZ  
2) W P to EP

Of Relevance to aishae  
+ leng - probably  
Route

Cultural P - arrive in  
N.Z.

To arrive in <sup>Train</sup> Selu + Cooks

retraced the way  
y gr ancestors - that 2 - y

Peter Buck - half Samoan - Maori  
~~things~~ things L to Hawaii

Gordon: His concern finalize a  
Sail Plan - Common sense/  
Good Seamanship.  
Goals / obj. Cultural  
Constraints. Budget  
Navigation (weather)

Physical / Mental Endurance  
Sailing Ability / Capability

Vital ingredi

1) Expand the naviga  
tional world of Nainoa.

2) Realign the  
Trad Sailing Route

3) (T / CD.) N.Z. - Dead

fewer  
4) Mugs / Dial

a) H-T (P.T.)

b) Cooks (B)

c) N.Z. (Keye)

home way of addressing C.

C- NZ 19 trad.  
To Tahiti

Cultural Relationship -  
scientific / non-scientific  
community

Feasibility of present sail plan  
1) 1st time

Major Island Groups + Secondary  
Groups (Island  
hopping) (What are there?)

Let feasibility/practical  
pick & choose

Map to Hawaii - does  
prove

Suggest from  
Hawaii into Samoa / Tonga /  
relate to NZ. doesn't  
out into C. & from



N.3. S. to Mang. to Hawaii.  
Abiding Samoa / Tonga  
Feel strongly about going to  
Fiji. Fiji / Tonga / Samoa.

Our goal incl. W-E movement -  
to westward  
+ testing tracking ability.

2 N Zealand  
Doesn't feel you

Maina - we L it to tie it in  
to a scientific base.  
+ B.T. + decide ✓ /  
(scientific)  
Fatigue factor of canoe  
+ crew Budget.

Don't L to Tracy  
2 a scientific base

Re: the naviga, + the  
vessel  
Sail the routes  
Dr. to sail to  
sail 4 weeks.

a Dr. Ben to Sprules  
& me

Primary obj - relate  
to 2

W to East

Maui to Hawaii

(happened of weekly removal)

B. Finney - Samoa - Puka, Puka

[Write a short memo, then have  
a meeting]

Prob: color chart - migration  
(then look into whether  
the vessel got there)  
Give us a flow

~~Ben~~ <sup>Purley</sup> did mention about assisting  
in writing an article.

Do investigations / publish / —  
1980 no credibility  
nothing published. B.F.

co-author of an article —  
shot it down  
to the Polyn. Society.

Ideo-syncretic - tradi / Plaus /

<sup>Spec</sup> Ability of human being  
to make good judgment  
& compare it of Carolan  
system

My audience - Journal of  
Polynesian Society

A lot has been done. Analysis  
of the daily stuff.

Basic daily navigation —  
Problem of lack of

Credibility  
Foster & Dixon it out  
B.F. - Research side  
emphasized

I ✓ 5 possible & out in them  
II Name doubt - 1976  
(Sail course hard &  
wend)  
Trip for more navigational  
feat.

III 3 portions - Let's / again -  
particular approach  
prior to 1980 & give as it  
1980 & route map.  
content: Analyze & parti. navig.  
table 2 / u - what  
was / not good  
Nainoa - mental course line  
middle line

factor C governed the  
decision  
P & i it governed the

decision line.

B.7. Pick out ~~its~~ along  
the voyage & abstract  
those ~~best~~.

Succinctly characterize  
your method & Man's method.  
Replication of the 1976  
experiment.  
Differences between  
your systems.

B.7. ~~to~~ to see the  
data. All he has is  
Will's manuscript.  
Lay it side by side w/  
the Carolinian method.

P- ~~to~~ to 26  
1) Sail / ~~on~~ out  
info recent  
2) Cultural-storaging

Will/Dixon/Nainoa/Ben Finney/  
Steve S.

B.7. Fine. put it  
together in a fashion  
package

Dixon/Will/Nainoa — will

meet 1st.  
Maine Science Bldg.

B. Ben Finney — get memo to  
me + distribute.

\$10,000 a year for the leasing and data retrieval  
from the transponder

\$3,000 for computing and plotting

\$1,000 for recorders

\$15,000 salary (half/time) for Nainoa to work on  
navigation material after the voyage has  
been completed.

? Publishing



## University of Hawaii at Manoa

Department of Oceanography  
Division of Natural Sciences  
1000 Pope Road • Honolulu, Hawaii 96822  
Telephone: (808) 948-7633 • Cable Address: UNIHAW  
February 22, 1984

Mr. Archie Shaw III  
Service Argos  
F.B. 4 Mailstop E  
Washington D.C. 20233

Dear Mr. Shaw:

I am writing for information on the Argos System on behalf of the Polynesian Voyaging Society. This non-profit society supports the voyages of the Hokule'a, a performance replica of the prehistoric Polynesian sailing double-canoes, in order to study non-instrumental navigation as well as the sailing characteristics of such vessels.

Two round trips between Hawaii and Tahiti have been made by the Hokule'a. On the second of these, in 1980, we borrowed an Argos PTT from oceanographers at the Scripps Institution of Oceanography, who were carrying out an extensive buoy-tracking program at that time. They also supported our use of the system. We have found the navigational data of enormous value in our analysis of the non-instrumental navigator's work; in addition, of course, the ability to keep track of the canoe's progress adds greatly to the safety of those aboard.

At present, the Society is making plans for another long voyage, to begin in 1985. This trip will be in several stages, and will include a visit to New Zealand; the total time involved will be approximately two years. Based on the 1980 results, we feel that the Argos system is essential to the project.

Unfortunately, Scripps is no longer in a position to help us. We will appreciate anything you can tell us about the availability of PTT's (the type illustrated in the Argos newsletter as being used on racing yachts would seem ideal), and whether these units can be rented, with cost estimates. Also, any details on costs of using the system, and options for data retrieval, would be appreciated.

We will be very grateful for your assistance.

With regards,

Edward D. Stroup  
Chairman, Department of Oceanography  
Board of Directors, Polynesian Voyaging  
Society

EDS:ds

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Mar  
Here is some new info  
on the ARBOS satellite  
positioning units, which  
can now be rented. Please  
arrange that the Board  
sees this, + Naimoa too.  
I would most strongly urge  
that the ARBOS system be  
budgeted for on any future  
long trip, for safety even  
more than for research!

I get these bulletins,  
+ will forward all pertinent  
info -

Dixon