80
SHEETS

WEXFORD

TAHITI-NAPUKA GEORGE BALAZS

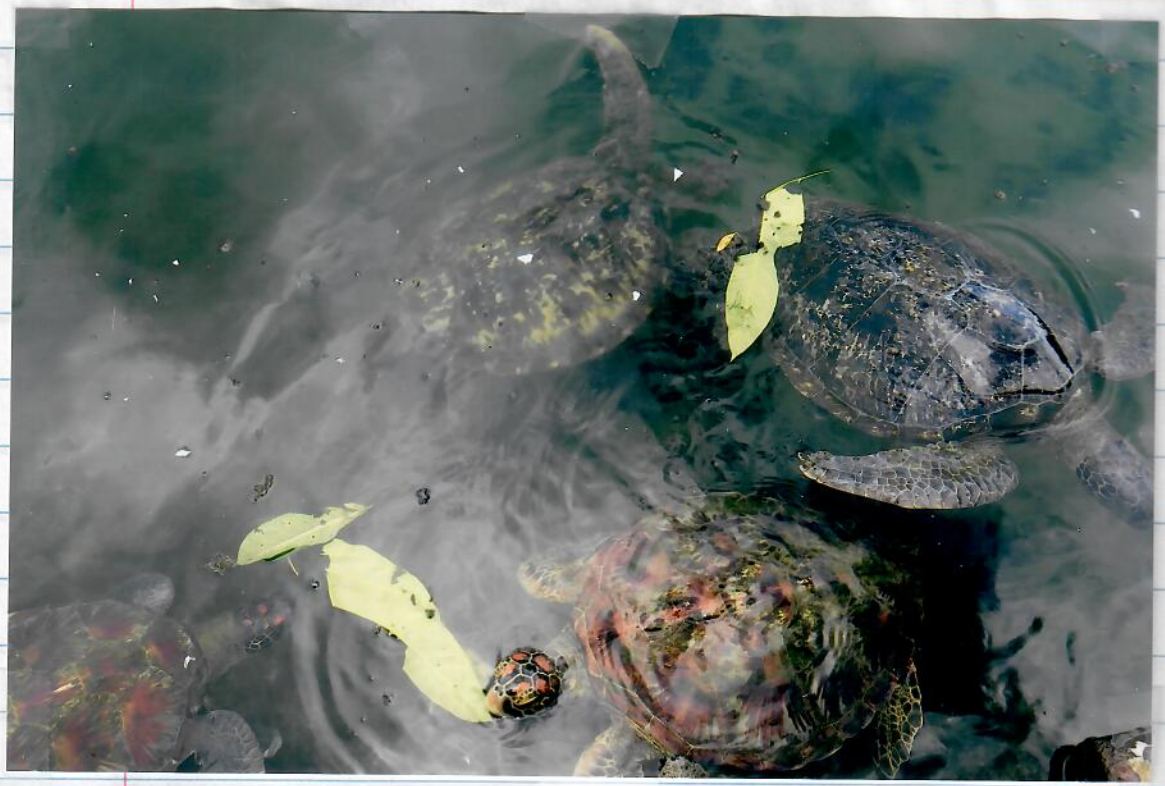
Wide Ruled
Composition Book

26 OCTOBER-9 NOVEMBER 2019
SAT. AT/SUN TATTOOS

SAMOA NOV25-DEC 6 6&8

BALAZS+1808683-8402 Nov 2019

TAHITI-HUAHINE
22 FEBRUARY-
2 MARCH 2020



141

30 DAY SAMOA DRIVERS LICENSE

GOVERNMENT OF SAMOA
LAND TRANSPORT AUTHORITY
SAMOA TEMPORARY DRIVER LICENSE

№ 58981

Foreigner Licensee Information

Full Name: George Balazs
Date of Birth: 26/2/43
License class (es) held and current :
Conditions (if any):
Issue Date:
Expiry Date: 26-2-2021
Driver License Number: 40016961 – USA
Signature of Licensee: [signature]

Details of LTA Authorised Licensing Authority (Rental Company)

Rental Company Name: Jets Rentz
Authority:
Address: Salelologa, Savaii
Phone: 7778029
Email address:

Temporary License No:
(Use foreigner D/L No. as a TDL Number)

Failure to comply with the following terms and conditions of this Temporary Drivers License **("TDL")** will result in the immediate suspension or revocation of the Temporary Drivers License and/or the appointment of the Authorised Licensing Authority.

1. This TDL allows you to legally drive in Samoa from the date of issue till the expiry of the TDL.
2. Authorised Licensing Authorities are prohibited to issue a TDL to those persons who hold a Learner/Restricted/Probation/Provision 1/Provision2 Drivers License from overseas, or to anyone with a Local Driver's License.
3. The TDL must be carried at all times when you drive on the roads subject to license classes and conditions endorsed.
4. This TDL is not valid unless signed by the Licensee.
5. The Authorised Licensing Authority is prohibited from charging more than the stipulated amount for a TDL as noted below and failure to comply with this will result in legal action and immediate revocation of appointment.
6. Monthly payments to be submitted to the LTA Main Office at the end of every month.

Validation: ☑ 1 month ☐ 2 months

Issue Date: 30/11/19

(seal)

LICENSING AUTHORITY
30/11/2019

TDL Fee: $21.00 – 1month ☑
$42.00 – 2months ☐

Date: 2/12/19

Jetz Rentz of ALPS Engineering

Gateway to Savaii
PH: 8446300 * Mobile: 7778029
E-mail: ofa@jetzrentz.ws

№ 8485

Received From: George Balazs

The Sum of: CASH Two hundred Forty Tala Sene

Being: 2 Extra days - Mazda Demo R881

Amount: 2 DAYS $ 240 —

Received by

Payment Mode: TALA

Pls Refer to Agreemnt #6776/Receipt #8452

Jetz Rentz

Travel, Tours, & Rentals
a Division of Jet Over Hotel

SAVAII
12/2019

NAME OFU

P.O. Box 1612
Apia, Samoa

Phone: **7778029, Savaii**
Web: **https://www.jetzrentz.ws**
FB: **Jetz Rentz**
Email: **ofa@jetzrentz.ws**

№ 6776

7. If the Customer has directed the billing for charges to another person, firm or organization who or which, upon be so billed shall fail to make payment, Customer will upon demand of owner promptly pay said charg... re.

8. The Customer acknowledges that he is solely liable for any and all personal injuries, including death and properly damage, arising out of, or by reason of the use of said vehicle, that the Owner has provided bodily injury liability, and property damage liability in such limits or amounts not less than required under Samoa Law.

9. The Customer proceeds at own risk and expense on all private and unpaved roads.

10. Insurance Deduction/Excess on windscreen is **$300.00**

11. Customer to come up with: (1) Police Report (2) Copy of drivers license (3) Insurance Deductible / Excess Bond of **ST 2,000.00** and (4) Fill in Insurance Claim Form, if any accident occurs.

12. Customer to repair their own flat tyres unless broken/damaged then gets to pay for tyre costs

13. Al rental agreements subject to audit and adjustment if necessary.

14. Insurance Deductible/Excess for damage to vehicle is ST **$2,000.00**

15. Additional Excesses: Driver Age
The following excesses are additional to the standard policy excess-

Drivers under 21 years of age	-	**$350.00**
Drivers 21 years to 24 years of age (inclusive)	-	**$200.00**
Drivers aged 25 years or more, but who have not held a driver licence for 3 or more years	-	**$200.00**

APIA AIRPORT 12/5/2019 Flight Cancelled

American Samoa Visitors Bureau 7

Talofa, if its a tour you want, information about our islands, looking for accomodation or a rental car, or you just want to learn about Samoan culture, drop by our office

Our Polynesian Heritage

American Samoa's islands make up the eastern part of the Samoan Archipelago, whose people are Polynesian. Today Samoans are regarded as the largest full blooded Polynesian race left in the Pacific.

Early Polynesians traveled from South East Asia into the Pacific, populating the western Pacific islands, from Papua New Guinea to Samoa and Tonga. From there, the Polynesians migrated east and populated the Cook Islands, Niue and Tahiti before heading north to Hawaii and south to Aotearoa (New Zealand) on the last legs of the great Polynesian migration.

Protocols and Customs

Fa'a Samoa is strongly focused on respect and service. Samoans welcome the opportunity to share their heritage with visitors.

- Samoans are very religious and in some villages each day a "sa" or curfew is imposed during the evening prayer (usually between 5pm and 6.30pm) depending on the village.
- Avoid walking around the village during these curfews which normally last about 30 minutes.
- Sunday is a day of worship, spending time with family and rest, so no work is done and people are asked to respect this day. All major shops are closed, but visitors can buy goods from the local village stores found through the islands.
- Visitors are welcome to attend church and if you wish to do so please dress appropriately, a blouse and long skirt for the ladies and the men, shirt and trousers.

Beach Access and Donations

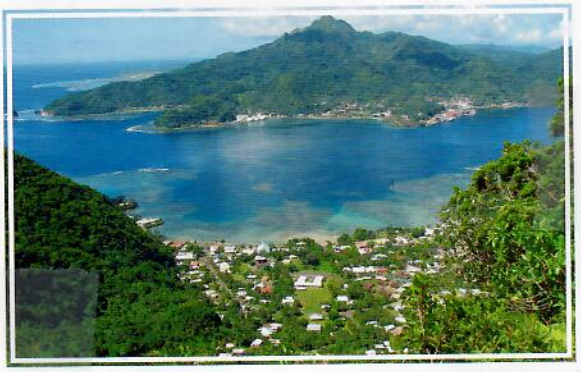
- If you intend to stop off at a beach, ask permission to use the beach at a nearby home as these are normally located on customary land. In some cases a small donation or fee of a couple of dollars is charged.

Behavior and Dress

- Beach swimwear – bikinis etc. are appropriate to wear while at the beach, but if you intend to go into the village please cover up by putting on a t-shirt or lavalava (sarong).
- When entering a fale (home) please note:
  - Remove your shoes or slippers at the door
  - Never stand when elders are seated
  - When seated, sit cross legged or tuck legs to the side and never point your feet at someone. If you cannot cross your legs, cover them with a lavalava or mat.
- Always ask permission from your hosts or someone before taking photos in a village.
- Tipping is not expected or customary in American Samoa. If you wish to leave a gift for good service, you're welcome to.
- If you are not sure about protocols or what to do, simply ask. Your hosts or someone nearby will be happy to help!

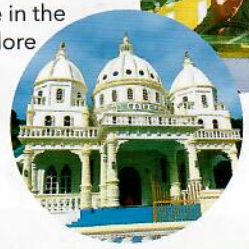
20 Things To Do

1. Take a tour of Maugaoalii Government House - the official residence of the Governor and First Lady
2. Visit the National Park of American Samoa on Tutuila and the Manu'a Islands
3. Take a drive from Pago Pago Harbor over to the village of Vatia and enjoy the breathtaking view of the harbor below



4. Drive toward the west and visit the National Marine Sanctuary of American Samoa at Larsen and Fagatele Bay
5. Lunch at Utulei Beach and enjoy the spectacular view of Pago Pago Harbor and Rainmaker Mountain opposite
6. Experience some traditional Samoan food like palusami and taro found in many local eateries and at the new marketplace in Fagatogo

7. With a map in hand, hop on a local bus and head east or west to take in the picturesque villages and explore new areas



8. Visit a local church on a Sunday morning and enjoy the rousing sermons and melodic singing
9. Let's go shopping for American and International goods at prices cheaper than anywhere else in the world and no sales tax taboot!
10. American Samoa has an extensive US Naval History, so pick up a US Naval History and World War II Guide and learn!

11. Take a trip to the Manu'a Islands, half an hour flight east of Tutuila Island
12. Visit Ofu Beach in the Manu'a Islands, voted one of the mos beautiful undiscovered beaches in the world (pictured above)
13. Catch a local alia boat for the short trip to Aunu'u Island and hike to the quick sand lake

14. Visit the Tia Seu Lupe Park (Starmound) an ancient stone structure in Ottoville

15. The view of Pago Pago Harbor from the water is one of the most spectacular in the Pacific, especially from an outrigger canoe
16. Traditional Samoan garments are great gifts to take home: Women's Puletasi (two piece long fitted blouse and skirt) & Men's Samoan island shirt
17. Take a drive up to the mountain village of Aoloau and take in the grand views of the Tafuna Plain below and the northern Pacific Ocean
18. Take a visit to the Jean P. Haydon Museum in Fagatogo and view the exhibit of American Samoa's link to the Apollo Moon Missions, complete with moon rocks
19. There is nothing like the hustle and bustle of local market and the new Fagatogo Marketplace is a local favorite shopping spot
20. The thrill of catching some big game fish - like tuna, marlin and sailfish - is only a half hour boat trip from shore

General Information

It's all about location!
American Samoa is located in the center of the Pacific Ocean, halfway between Hawaii in the north and New Zealand in the south. Our geographic coordinates are 14 16 S, 170 42 W.

Money, Banks and ATMs
The United States Dollar is the currency used in American Samoa Major foreign currencies can be exchanged at local banks. There are three major banks on island, the Bank of Hawaii (BOH), the ANZ Amerika Samoa Bank (ANZ) and the Territorial Bank of American Samoa (TBAS). The BOH branch is located in Tafuna and is open Monday to Friday 9.00am to 3.00pm. The ANZ has branches in Fagatogo and Tafuna and open weekdays 9.00am to 4.00pm. The TBAS is located in Utulei and open Monday to Friday 9.00am-4.00pm. All three have ATMs located around the island - see the map for location sites.

How To Get Here
Three international airlines fly to American Samoa from Hawaii and Samoa. Hawaiian Airlines operates bi-weekly flights from Honolulu to Pago Pago, while both Samoa Airways and Talofa Airways operate daily services from Apia, Samoa. For further information and flight schedules visit their respective websites.

Weather Forecast
American Samoa has a tropical climate all year round with two distinct seasons, the wet and dry season. The wet season is usually from November to March and the dry season from April to October. Average daily temperature ranges from 84–86 Fahrenheit or 29–30 Celcius.

Learn a little Samoan...

There's nothing that puts a smile on our faces more easily, than when visitors to our islands take the time to learn a few Samoan words and phrases. We've listed a few words and a couple of phrases and given you a pronunciation guide to help you along So give it a go, you'll put a smile on everyone's faces including your own!

English	Samoan	Pronunciation
Hello	Talofa	Tah-low-fah
Goodbye	Tofa	Toh-fah
Thank you	Fa'afetai	Fah-ah-fay-tie
Please	Fa'amolemole	Fah-ah-more-le-more-le
Yes	Ioe	Ee-oh-e
No	Leai	Le-ah-e
Maybe	Masalo	Mah-sah-loh
Tomorrow	Taeao	Tah-e-ow
Goodnight	Manuia le po	Mah-noo-e-ah-leh-poh
How are you?	O a mai oe?	O-ah-my-o-he
I am hungry	Fai ai	Fear-ah-ee

Talofa! Welcome!

American Samoa's total land area is 76 square miles, made up of five volcanic islands (Tutuila, Aunu'u, Ofu, Olosega and Ta'u) and two atolls (Rose and Swains).

Including our marine waters, the total area is 117,500 square miles, about the size of the State of Oregon or New Zealand. With steep volcanic mountains, American Samoa is a tropical paradise. The climate averages 82-83°F year-round and the ocean waters surrounding our islands average 82-86°F.

With 90% of our islands covered in untouched tropical rainforest, our flora and fauna is very unique. The National Park of American Samoa is the only US Park in the Pacific, offering challenging and dramatic hiking trails to historical sites, secluded beaches and villages.

From hiking tropical rainforests, to swimming, snorkeling, diving or fishing our surrounding ocean waters, American Samoa is an ecotourism haven for visitors wanting an undiscovered paradise.

MileagePlus UNITED

Manage your account online: www.chase.com/united

Customer Service: 1-800-537-7783

Mobile: Download Chase Mobile℠ app

Check #

12/6/2019

Due 12/19/19

ACCOUNT ACTIVITY

Date of Transaction	Merchant Name or Transaction Description	$ Amount
PAYMENTS AND OTHER CREDITS		
11/15	Payment ThankYou Image Check	-862.35
PURCHASE		
10/22	GOOGLE *Google Storage 855-836-3987 CA	2.39
10/29	HTL TIARE TAHITI3241549 A7PAPEETE 10/31 CFP FRANC 34,950 X 0.009346208 (EXCHG RATE)	326.65
11/09	HTL TIARE TAHITI3241549 A7PAPEETE 11/13 CFP FRANC 46,600 X 0.009251502 (EXCHG RATE)	431.12

151

Jessica Carew Takei '93 is living in Honolulu with her family. She and husband Bobby have two beautiful children: Leleo is 7 and Vaitea is 4. Jessica earned a B.S. in Aquatic Biology at UC Santa Barbara and an M.Ed. in Educational Psychology at UH Manoa. For the past six years, she has primarily been a mom to her children, helping out at the Honolulu Waldorf school and teaching a few weeks of Summer Fun there. This fall, she will be working more for Kealopiko, which creates designs and clothing inspired by the natural, cultural, and historical landscapes of Hawai'i, at their South Shore Market store. Jessica writes: "Besides navigating motherhood these past years which is always exciting, I have really been enjoying getting my fitness and health back on track with the help of the Body Back program through Fit4Mom Honolulu. I love it so much that I became an instructor, teaching classes twice a week. I really enjoy supporting mamas in their postpartum journeys."

MAKEKULA
WINTER 2019

CARAPACE ALLIANCE
TESSA BUCHIN, RVT

650 776 2969
WWW.CARAPACEALLIANCE.COM
CONSERVATION & MEDIA

ACCOUNT ACTIVITY

Date of Transaction	Merchant Name or Transaction Description	$ Amount
PAYMENTS AND OTHER CREDITS		
03/07	Payment ThankYou Image Check	-1,464.25
PURCHASE		
02/20	THE UPS STORE 5877 HONOLULU HI	176.02
02/25	VAHINERII TEA H 4419144 A7PAPEETE 02/27 CFP FRANC 2,750 X 0.009141818 (EXCHG RATE)	25.14
02/26	EUROPCAR HUAHINE A7HUAHINE 02/28 CFP FRANC 10,500 X 0.009223809 (EXCHG RATE)	96.85
02/24	AIR T VEL 4423860 A7FAAA 02/29 CFP FRANC 25,635 X 0.009263897 (EXCHG RATE)	237.48
03/01	HTL TIARE TAHITI3241549 A7PAPEETE 03/03 CFP FRANC 85,575 X 0.009375518 (EXCHG RATE)	802.31
02/28	VAHINERII TEA H 4419144 A7PAPEETE 03/03 CFP FRANC 4,000 X 0.009375000 (EXCHG RATE)	37.50
03/02	IN *BLUE SALAMANDER SOLUT 803-2703762 SC	199.5[illegible]

MARCH 2020
#1574.80
CHASE CARD SERVICES
CHECK 3/28/2020 #

Hôtel Tiare Tahiti

417, Boulevard Pomare - B.P. 2359 - Papeete - Tahiti
TEL : (689) 40.50.01.00 - FAX : (689) 40.43.68.47
R.C. 5550 B - N° TAHITI 333.559 - COMPTE BANQUE DE POLYNESIE : 00408201028

Oct. 2019

POUR: EXCESS WEIGHT XPF 3850

ASSOCIATED E-TICKET/COUPON NUMBER: 1352407174653 C1
ASSOCIE AU BILLET/COUPON NUMERO: 1352407174653 C1

EXCESS BAGGAGE: 7 KILOS CHARGE PER KILO: XPF
EXCEDENT DE BAGAGE: 7 KILOS PRIX PAR KILO= XPF

DVC-35479 0044 29OCT19 2019

AGENCE AIR TAHITI PPT
TEL 40474400 LUNDI - VENDREDI 08H/17H SAMEDI 08H/11H

REFERENCE DOSSIER: QZQYJ
DATE/HEURE: 29OCT19/0044

AGENT DE VENTE: 570 /023

POUR PASSAGERS:
BALAZS/GEORGE MR

STATUT BILLET:
BILLET EMIS 2407174653 VT

Cow. 6 30

MER 30OCT 19
AIR TAHITI 955 Y APPAREIL-AT4 / NONSTOP /
DEPART: PAPEETE, SOC. IS., FR. POLYNES 0800 TERMINAL: D1
ARRIVEE: NAPUKA, TUAMOTU IS., PACIFIC O 1005
*** CONFIRME ***

Cow 10 05

MAR 05NOV 19
AIR TAHITI 955 Y APPAREIL-AT4 / STOP-2/
DEPART: NAPUKA, TUAMOTU IS., PACIFIC O 1105
ARRIVEE: PAPEETE, SOC. IS., FR. POLYNES 1535 TERMINAL: D1
*** CONFIRME ***

2019 Air Tahiti My Schedule 40 NAPUKA (153)

MANIFESTATION

Entre convention du tatouage et élection de beauté

10 NOV 2019 LA DEPECHE

L'association Polynesia Tatau organise la 7e convention internationale du tatouage qui se tient jusqu'au 9 novembre, à Punaauia, et qui verra pour la première fois l'élection de Miss et Mister Tatau, en guise de final.

Une cinquantaine de tatoueurs sont présents pour tenter d'emporter l'un des nombreux prix en jeu. Le principe même d'une convention.

Quarante tatoueurs viennent de Tahiti, Moorea, Raiatea et des Marquises et dix de Nouvelle-Zélande, Samoa, France, des États-Unis et du Canada. Trois d'entre eux, qui pratiquent le tatouage traditionnel, officieront sous la pergola, dans les jardins de l'hôtel Tahiti la Ora beach resort qui accueillera également de nombreuses animations.

Outre le public attendu nombreux, d'autres se préparent. Ce sont les six candidates et les cinq candidats à Miss et Mister Tatau, la première élection de vahine et tane tatoué(e)s, qui se tiendra le 9 novembre. Christophe Robien, directeur des comités Ink Girl & Boy France, sera président du jury, assurant ainsi aux deux lauréats une place à l'élection nationale, qui se tiendra en avril 2020, titre qu'avait remporté en 2017 Estelle Anania, aujourd'hui organisatrice de cet événement qui fait intégralement partie de cette convention. Trois passages sont prévus – traditionnel, maillot de bain et tenue de soirée. Tatouages et prestation scénique feront la différence. Un feu d'artifice, divers shows et les concerts de Maruao et d'Angelo cloront cette grande fête du tatouage et du *patutiki*.

• Jusqu'au 9 novembre au Tahiti la Ora beach resort de Punaauia. Entrée : 500 F/jour. Première élection de Miss et Mister Tatau, le 9 novembre, à partir de 18 h 30 (et concerts de Maruao et Angelo). Tarifs : 3 000 F en prévente ; 3 500 F le soir-même. Plus d'infos sur la page Facebook de l'événement, "Tattoo convention internationale Polynesia Tatau 2019".

NOTES TAHITI
JULY 2019

SCAN TAHITI BOOK
Scan BLACK WAVE for web site
Rollett Turtles prints — HAL CREEL SCAN
scan
Road Body Goes. Scan
(Hibiscu scan
Taggings X

over for Notes

OPERATED BY
HMS HOST
... STARBUCKS COFFEE
... INTERNATIONAL AIRPORT
35052 Jennife...
CH 307
JUL ... 9 2:23PM
... IN
MEDIUM T
... BLU
... Ulange M...
AMOUNT PAID
14046D XXX5769
VISA CC
35051 Closed JUL ...
... TO HEAR YOUR FEEDBACK
... SE CONTACT 1-877-672-7467
... STOMERSERVIC... MSHOST.COM
... SHARE YOUR ... ERIENCE!
STORED: ...04

HI AHAND

2010 CD INTAHITI Book

"The Life Blood of the People Bonded to The Blood of the turtle."
5 MARCH 2018 envoute ...
by GHB

Hôtel Tiare Tahiti

Warm Welcome

PHONE : (689) 40 500 100
FAX : (689) 40 436 847

TAHITI LA DEPECHE
10/28/2019

EN IMAGE

Photo : présidence

HISTOIRE - Cérémonie de souvenir en hommage à Pouvana'a a Oopa

Le président du Pays, Édouard Fritch, a assisté vendredi matin, à la cérémonie de souvenir en hommage au "Metua", Pouvana'a a Oopa, devant la stèle commémorative qui lui a été dédiée, place Taraho'i, à Papeete.

Dans son allocution, le président a tenu à rappeler que Pouvana'a a Oopa est l'un, si ce n'est le plus grand des personnages de l'histoire de la Polynésie depuis la seconde partie de la décennie 1950. Il était dès lors plus que légitime que ce monument lui soit dédié afin qu'il soit possible, d'une part, de le célébrer et, d'autre part, de disposer d'un lieu d'inspiration élevant les réflexions de chacun.

LDT

TINA & NATASHA Swim w/ turtles Photos

12/2/2019 Monday

Live in Opolu

christina@spasamoa.ws

nateroma90@gmail.com.

May :) Lin, Yaching

3F., No. 10, Aly. 5, Ln 38, Sec. 1

Lixing Rd., Sanchong Dist. New Taipei, Taiwan R.O.C


Tahiti


WELCOME TO
Swimming
TURTLES
PHONE : 54321

TAKERO
MATARIKI

160

TUI

Mataia Sue. 12 y.o. "Swimming Turtles"

Leisa -
Check in Lucias SAT. pm 12/29/19

EVA.


1964


2010

ÉTÉ DES OCÉANISTES

n de la Société des Études
.S.E.O.).
les Océanistes, Paris, (J.S.O.),
tory, Canberra (J.P.H.).
nds Océanie des Archives de
ot, Paris.
rritoriales de Polynésie Fran-
particulièrement la série Cor
Gubernatoriale).
septembre 1983 présente un
les Archives de Polynésie Fran-
sé par l'auteur.)
son, *Mémorial Polynésien*,
peete, 1979, 399 p.
iti Nui, Change and survival in
olulu, Éditeur ?, 1980, 380 p.
onial, Paris, Publications de la

YEAR

NW CORNER

FA'AHIA AND VAITO'OIA

Fishing, Turtle Hunting, and Mammal Exploitation at Fa'ahia, Huahine, French Polynesia.

By

R. F. LEACH [1], M. INTOH [2], and W. G. SMITH [3]

Introduction.

Fa'ahia and Vaito'otia are two small land divisions on the north-west corner of Huahine in the Society Islands (See Figure 1). An important waterlogged site was discovered at Vaito'otia in 1972, during dredging associated with construction of the Bali Hai hotel. The land immediately to the north is known as Fa'ahia, and the archaeological deposits are now known to extend into this land division too.

Excavations have been carried out under Sinoto's direction periodically since 1973 (Christensen 1981 ; Sinoto 1974, 1979, 1982, 1983a, 1983b ; Sinoto and Han 1981 ; Sinoto and McCoy 1975). There are two main cultural horizons — a lower one (Layer V) which is waterlogged, and an upper one (surface of Layer IV) thought to be recent occupational debris. There are six radiocarbon determinations for the early deposit in the range of AD 850 to 1 200, and the material culture may be ascribed to ' Archaic East Polynesian ', with affinities to early Marquesan and New Zealand cultures. These waterlogged deposits have produced significant wooden items — parts of outrigger canoes, paddle helves, tapa beaters, and wooden hand clubs (*patu*), as well as a rich assemblage of whalebone, shell and stone artefacts. The excavations have produced abundant osteological material, including fishbone, mammalian fauna, and bird bone. The assemblage was sent to the Otago Archaeological Laboratories for analysis. This paper reports the identifications of all except the bird bones, which are still being examined.

The bulk of the material derives from section 3, Zone A at Fa'ahia (Sinoto, 1979). This section may have been a stream bed (Sinoto, 1982), and the entire area investigated at Fa'ahia appears to have been a depression in the ground surface, which may have contained a pond or swamp. Any flooding, such as that resulting from tidal waves, may have accumulated in this area. The present high ground water table probably accounts for the excellent state of preservation of the faunal remains. A smaller quantity of bone material was recovered from Section 5, Zone A at Fa'ahia, about 30 m south-east of Section 3.

In the field, all material retained by a one quarter inch mesh (6.35 mm) wet sieve was kept for analysis. In order to obtain as complete a picture of faunal exploitation as possible, recognisable material which passed through the sieves, and material of uncertain or mixed provenance was also collected (Sinoto, pers. comm. 1984).

Environmental setting.

The waterlogged nature of these deposits indicates that the nearby environment may have changed at some time in the past.

1. Research Laboratory for Archaeology & the History of Art, Oxford. (On leave, Anthropology Department, Otago University).
2. Anthropology Department, Otago University.
3. Anthropology Department, Auckland University.

Although this matter is largely beyond the scope of this paper, the question arises as to whether the local marine setting was sufficiently unlike today to have to take this into account in evaluating the character of marine exploitation from these faunal remains. The cause(s) of the waterlogging is the crucial point. This matter is still under study. Possible contributing factors which have been suggested are as follows :

1. Tilting of the north-western part of Huahine (Kitagawa, pers. comm. to Sinoto, 1983a : 586).
2. A lowering of sea level relative to land of 3 m suggested for the Tuamotu archipelago (Salvat, 1970 ; Sinoto, 1983a : 586-7).
3. Tidal waves (*tsunami*) in the Fa'ahia district (Kitagawa, pers. comm. to Sinoto, 1983a : 587).

A noteworthy feature of Huahine, evident on the available French topographic map of the island, is the steep terrain near the sea in the south, and the presence of an elevated reef platform in the north. The combination of these two features certainly suggests some tilting process for the island as a whole, with the south sinking and the north rising. The archaeological site is located on part of this elevated reef flat (See Figure 1). In a situation like this, numerous purely local phenomena could be invoked to explain the waterlogged nature of the deposits (J. N. Jennings, 1983 : pers. comm.). For instance, local depressions in an uplifted sandy reef platform could remain waterlogged for long periods, despite their elevation above sea level, because of inability of water run-off to seep away quickly from the generally flat terrain. In addition, any storm ridges which might form subsequent to the uplift would further inhibit run-off, and thereby increase the tendency to form swampy land. Habitation sites, initially established on relatively dry land, could easily become waterlogged in the course of time, in a terrain with these features. Tidal waves do occur in French Polynesia, on average about once every ten years (Tallandier, 1980 : 613), and this certainly could be an additional factor. The effects of such events are well described by Davies, following just such an incident in Tahiti in 1805 :

> in the evening, an unexpected and uncommon rising of the sea took place, the low lands were overflowed and much damage done to taro plantations & c. This uncommon phenomenon excited fears, but they were soon somewhat removed, by the water quickly falling again. It was found afterwards that damage was done to trees and plantations in various districts of Tahiti, and also at Eimeo (Davies, 1961 : 79).

A possible complication in this matter is the recorded presence on Huahine of pole-houses, built out over the water (for example, see Anon., 1943 II : 171 ; Russell, 1935 : 139). These seem to have been common in the Maeva area on the north-east of Huahine, but Emory has noted that they were not present in 1818 (Emory, 1933 : 127). It may also be noted that an early 19th century woodcut of the village of Fare, near Fa'ahia and Vaito'otia, shows houses on the ground, not elevated (see Ellis, 1969). Handy reviewed this question carefully and concluded that " the sleeping house on posts or piles is a modern innovation, but there existed anciently, in Huahine at least, a counterpart of the old Polynesian *tapu* house on posts " (1932 : 7). The sole example of the latter cited by Handy was a specialised house near a marae.

Given that pole-houses over water were not present in the prehistoric period, we can assume that this land was reasonably dry when first inhabited ; thus, the uplifted reef platform in this area must have been elevated some time before occupation, and the waterlogging must relate to some other phenome-

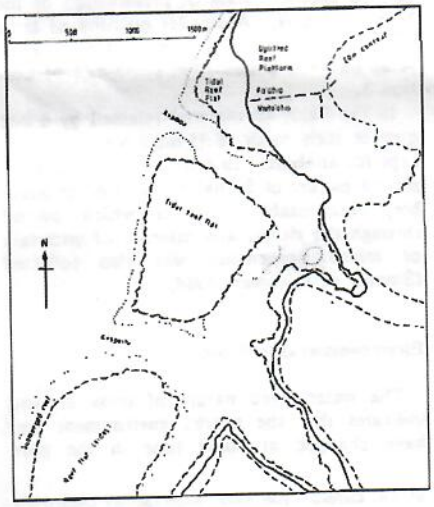


FIG. 1. — North-west Huahine showing the location of the Vaito'otia and Fa'ahia land divisions and the nearby terrestrial and marine environment. Note that the excavation are situated on an uplifted reef platform. A larger scale map is given by Sinoto (1983a).

NW Huahine

non. Some very local effect, inhibitinng run-off, seems the most likely cause. If so, significant marine environmental change can be ruled out for the nearby area, and the main present-day features can be assumed as being similar to those which prevailed during the period of prehistoric marine exploitation.

PRELIMINARY ANALYSIS OF THE FAUNAL MATERIAL.

Bags of material were spread out on plastic trays and sorted into major faunal categories as follows :

1. Fish
2. Bird
3. Turtle
4. Sea Mammal
5. Pig
6. Dog
7. Bovine

The clean and well-preserved nature of the bone material obviated any need to steam-clean the collection. All provenance data was entered into the Laboratory computer data base accession system, which generates an appropriate accession number and which is used as a cross reference to all detailed notes on the bags. The material was re-bagged at this stage in plastic bags, and on each was recorded the accession number, and abbreviated provenance information, typically as follows :

AC429 Accession Number
FA Fa'ahia
S Section
L3 Layer information

Additional abbreviations are :

Square ?? = no information
» Pit = a large pit feature
Layer 3 = Layer III
» 4 = Layer IV
» 5 = Layer V
» 9 = no Layer given
» 10 = Fill material (from pond dredging)
» 11 = Overburden
» 12 = Baulk

These designations are used throughout this paper, and their slighily different character to those used by Sinoto (1983a) should be noted.

Analysis of turtle and mammalian fauna.

The material was identified using reference collections at the Otago Archaeological Laboratories, the Auckland University Anthropology Department, and the Auckland Institute and Museum.

Minimum numbers of individuals were calculated for each species or class of fauna (depending on level of identification) by counting the most commonly occurring anatomical element. Timetables of tooth eruption and epiphyseal fusion in modern pigs and dogs (Silver, 1969) were used to estimate the age at death for these groups of animals. However, as the extent to which such data are applicable to prehistoric populations in the Pacific is not known, the reported ages should be treated as approximations only. The sub-specific affinities of the pigs (see Groves, 1983 ; n.d.) could not be assessed because of the juvenile state of the dentition. Similarly, the fragmentary nature of the dog remains prevented osteometric comparisons with other collections of prehistoric dogs (for example Wood Jones, 1931 ; Allo, 1970, 1971 ; Smith, n.d.a.).

The most abundant remains in this assemblage were those of marine turtles (Table 1). A minimum number of 25 individuals were identified from Section 3 (Table 2). The species to which these belong could not be established because of the lack of suitable reference material (Figure 2). However, clear differences in mandibular morphology indicate the presence of at least two species. On distributional grounds, these are most likely to

Animal	Section 3	Section 5
Turtle	25	1
Dolphin	5	
Large cetacean	1	
Pig	3	1
Dog	3	
Bovine	1	

TABLE 1 Fa'ahia reptile and mammal minimum numbers

Element	Left	Right	Minimum Number
Cranium			7
Mandible	6	7	7
Premaxilla	11	6	11
Coracoid	24	11	24
Humerus	25	25	25
Radius	3	6	6
Ulna	2	6	6
Pelvis	6	10	10
Femur	4	4	4
Tibia	3	2	3
Fibula	3	3	3
Extremities	2	1	2

TABLE 2 Fa'ahia Section 3. Turtle minimum numbers for each skeletal element. Note no attempt was made to quantify fragments of carapace or plastron. Extremities = scapula, tarsals, metacarpals, metatarsals, and phalanges.

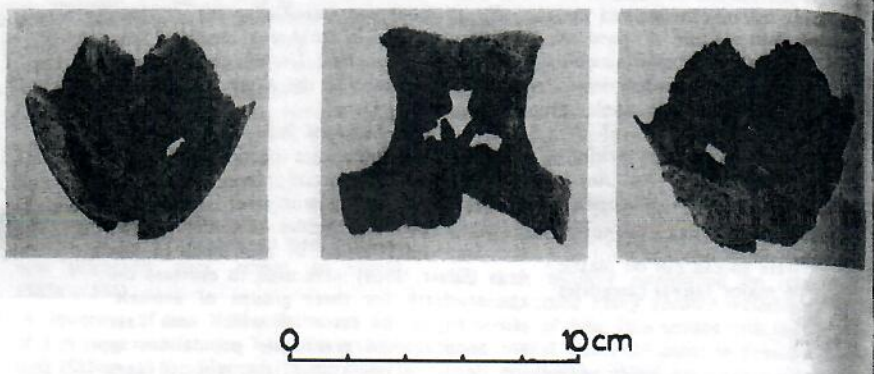


FIG. 2. — The maxilla of one of the turtle specimens from Fa'ahia (species uncertain).

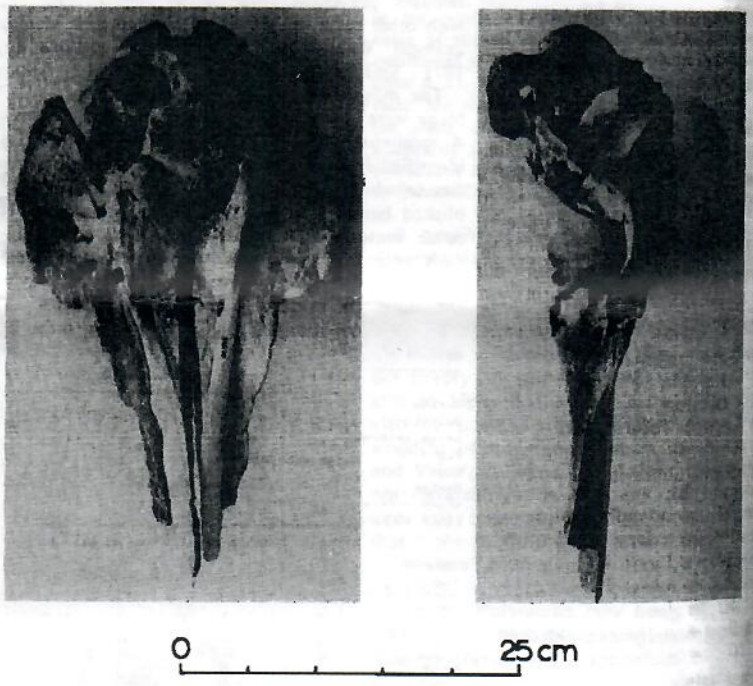


FIG. 3. — A complete dolphin cranium recovered from Fa'ahia (species uncertain).

FIG. 4. — Many of the dolphi
faces of the transverse proc

be the Green Turtle (*Che*
Hawksbill (*Eretmochelys*
two species reported fro
today (Anon., 1980 : 8).
(1975 : 176) suggested
turtle remains were prob
species, although some
tentatively identified by
Turtle (*Dermochelys cor*
modern evidence of the
part of the Pacific (Ano
it is a wide-ranging pelag
wide population numbers
tically low levels (Bustar
well have occurred on
prehistoric period.

The Fa'ahia turtle rem
size range, indicating th
not concentrated upon a
However, in view of the
ely establishing the spec
possible to assess the
information reliably.

Sea mammals are the s
class of animal in the a
Five dolphins are represe
by vertebrae, although o
cranium was also recover
again, positive identifica
was not possible. At le

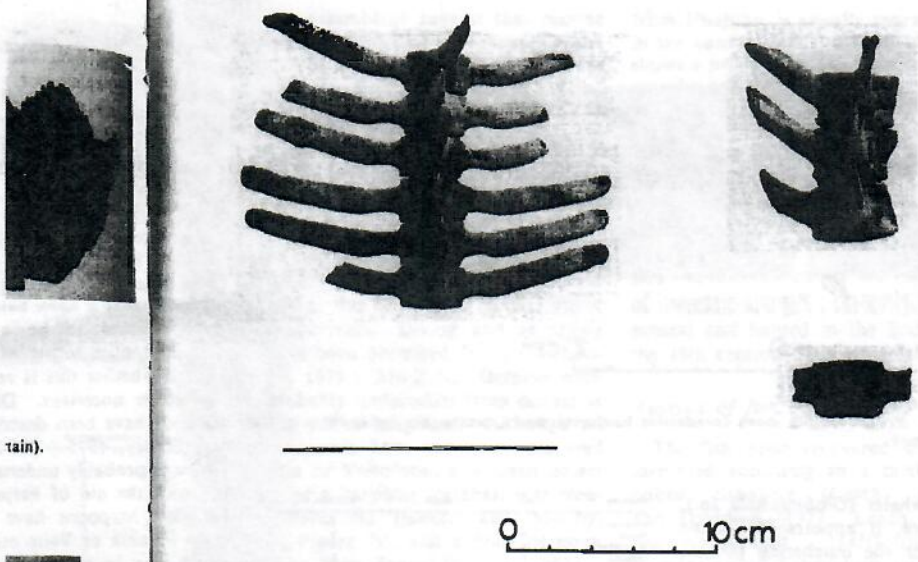


Fig. 4. — Many of the dolphin vertebrae exhibit butchering marks as shown here, predominantly on the dorsal surfaces of the transverse processes, such as would accompany removing dorsal muscles.

be the Green Turtle (*Chelonia mydas*) and the Hawksbill (*Eretmochelys imbricata*), which are two species reported from French Polynesia today (Anon., 1980 : 8). Sinoto and McCoy (1975 : 176) suggested that the Vaito'otia turtle remains were probably from these two species, although some limb fragments are tentatively identified by them as Leatherback Turtle (*Dermochelys coriacea*). There is no modern evidence of the Leatherback in this part of the Pacific (Anon., 1980 : 8), but as it is a wide-ranging pelagic species with world wide population numbers now reduced to critically low levels (Bustard, 1972 : 35), it may well have occurred on Huahine during the prehistoric period.

The Fa'ahia turtle remains included a wide size range, indicating that exploitation was not concentrated upon a restricted age class. However, in view of the difficulty in accurately establishing the species present, it is not possible to assess the implications of this information reliably.

Sea mammals are the second most common class of animal in the assemblage (Table 1). Five dolphins are represented, predominantly by vertebrae, although one virtually complete cranium was also recovered (Figure 3). Once certain, positive identification to species level was not possible. At least eight species of dolphin occur in the tropical Pacific, but three of these seem to be confined to deep off-shore waters (Watson, 1981), reducing the likelihood that they were the prey of prehistoric hunters. Three of the remaining species — the Spinner dolphin (*Stenella longirostris*), the Striped dolphin (*S. coeruleoalba*), and the Bridled dolphin (*S. attenuata*) — feed upon, and are frequently found about, schools of tuna (Watson, 1981 : 262, 265, 267). As will be seen below, tuna were abundant amongst the fish in the assemblage, and these three species therefore may be considered the most likely prey. The Common dolphin (*Delphinus delphis*), and the Bottlenose dolphin (*Tursiops truncatus*) appear to have somewhat different feeding habits (Watson, 1981 : 272, 274), but as they occur in coastal waters throughout the tropical Pacific, they too could have been hunted. There are no historic ethnographic records of dolphin hunting in the Society Islands which could give guidance on this matter.

Many of the dolphin vertebrae exhibit butchering marks, predominantly on the dorsal surfaces of the transverse processes (Figure 4). These marks would have been made during removal of the musculature along the dorsal surface of the vertebral column. This form of butchering has been noticed before in New

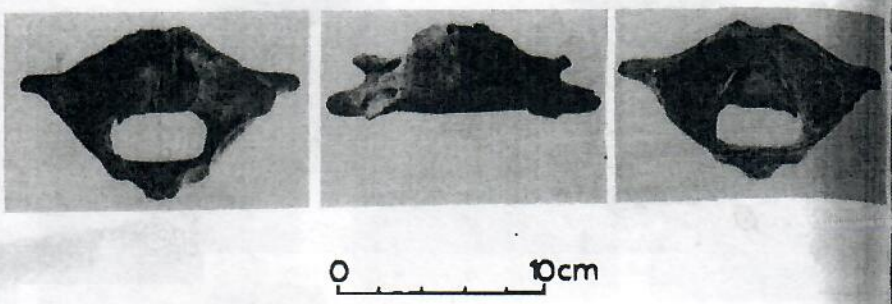


FIG. 5. — This dolphin cervical vertebra shows considerable butchering marks, presumably during the severing of the head from the trunk.

Zealand on pilot whales (*Globicephala* sp.), and in that instance, it appears that stone adzes were used for the butchering (Smith, 1979 : 221). However, in the Huahine case, the butchering marks are sharp fine cuts in the bone, suggesting a very sharp implement such as a stone flake, or perhaps a shell or bamboo knife. Flake tools made from an andesitic material are abundant in the site (Sinoto and McCoy, 1975 : 170-173), but these may not have been sharp enough to produce the observed cuts. This difference in technique of butchering dolphins and pilot whales may reflect the size difference between the two animals. Numerous fine butchering marks also occurred on the first cervical vertebrae of a large dolphin (Figure 5), presumably resulting from the severing of the head from the vertebral column.

Intervertebral plates and fragments of vertebrae from a much larger cetacean are also present in the assemblage. These would appear to be from an animal of the size of a large pilot whale (*Globicephala* sp.), or a small Sperm Whale (*Physeter macrocephalus*). In view of the abundant use of whale bone for the manufacture of artefacts at both Vaito'otia (Sinoto and McCoy, 1975), and Fa'ahia (Sinoto, 1979) these remains may be industrial raw materials collected from beach-wrecked animals, rather than food remains.

Remains of three pigs (*Sus scrofa*) were recovered from Section 3 (Table 3), with one further fragment from Section 5. Consideration of the epiphyseal fusion and tooth eruption indicates that all three animals from Section 3 were less than one year old at death, with at least one of these less than six months in age. No estimate of age was possible for the individual from Section 5.

Three dogs were also represented in Section

Element	Left	Right	Minimum Number
Cranium			1
Teeth	1	1	1
Mandible	1	1	1
Scapula	2	1	2
Humerus	2	2	2
Radius		1	1
Ulna	1		1
Carpus	1		1
Metacarpus		1	1
Phalanx (fore)	?	?	1
Pelvis	2		2
Femur	2	2	2
Tibia	2		2
Tarsus	1	1	1
Metatarsus	1		1
Phalanx (hind)	?	?	1
Vertebra			2
Ribs	?	?	1

TABLE 3 Fa'ahia Section 3, Pig minimum numbers for each skeletal element.

Element	Left	Right	Minimum Number
Cranium		-	3
Teeth	1	2	2
Mandible		1	1
Scapula	1		1
Humerus	1	1	1
Ulna		1	1
Metacarpus	?	?	1
Pelvis	?	?	1
Tibia	1		1
Tarsus	1		1
Metatarsus	1		1
Vertebrae			1
Ribs	?	?	1

TABLE 4 Fa'ahia Section 3, Dog minimum numbers for each skeletal element.

3 (Table 4). All of these animals were young. On the basis of tooth eruption, two individuals appeared to be approximately four to six months at death, and the third was less than three and a half months old. The unfused state of the long bone epiphyses, and the small size of the cranial remains is consistent with these estimates.

The Fa'ahia assemblage also included a number of bones and teeth of cattle, probably belonging to one individual. These remains are considered further below.

Discussion of turtle and mammalian fauna.

The reptilian and mammalian fauna from Fa'ahia are indicative of a broad range of subsistence pursuits. The turtles and dol-

FISHING, TURTLE HUNTING

phins in the assemblage s
hunting was an important
economy. While there ar
tions of the hunting metho
probable methods can b
majority of turtles are m
been taken when emerging
nest or breed, though so
have been caught in fishin
be noted that a hook baite
been claimed to be a
method applied to turtles (C
though whether this is rele
catches is uncertain. Divi
methods have been describ
tus (Emory, 1975 : 216-21
ting was probably undertak
sea with the aid of harpoc
complete harpoons have y
from Fa'ahia or Vaito'otia.
which may be a harpoon f
vered at Vaito'otia (Sinc
1975 : 169, Figure 7s), anc
fragment has been found
590). Harpoons occur in
sian assemblages from the
Zealand, and both these ar
evidence of dolphin hunting
Smith, n.d.b.). In additio
wooden clubs have been re
fite, and could have been
dolphins rather than, or in
use as fighting weapons.
does not rule out this possi
artefacts are thought to hav
used in the Chatham Island
Sutton and Marshall, 1980
invariably so (see Sutton, 1
other hand, dolphins may b
kill outright with a *patu* th
The exploitation of dom
clearly also an important
lence. Dogs appear to
within the first year of li
only three pigs occur, these
by this age. It is difficult
best to interpret this. In
European societies engaged
selective culling of both yo
months) and old individual
months) was practised (see
135), leaving the breeding
There is little guidance on
ethnographic literature on
However, Rappaport (1967)
Highlands Papua New Guine
ween one and two years is
for pig trade and exchange
evidence from the Pacific, c

during the severing of

Minimum numbers

1
1
2
3
1
1
1
1
2
2
3
1
1
1
2
1

bers for each skeletal element.

Minimum Number

3
2
1
1
1
1
1
1
1
1
1

umbers for each skeletal element.

these animals were
tooth eruption, two
e approximately four
nd the third was less
nths old. The unfu-
ıe epiphyses, and the
remains is consistent

ıge also included a
teeth of cattle, pro-
e individual. These
urther below.

mammalian fauna.

mmalian fauna from
of a broad range of
he turtles and dol-

ains in the assemblage suggest that marine unting was an important component in the onomy. While there are no clear indica-ns of the hunting methods employed, some obable methods can be suggested. The jority of turtles are most likely to have en taken when emerging from the sea to st or breed, though some are bound to ve been caught in fishing nets. It should noted that a hook baited with seaweed has en claimed to be a traditional fishing ethod applied to turtles (Oliver, 1974 : 286), hough whether this is relevant to prehistoric atches is uncertain. Diving and grappling ethods have been described for the Tuamo-s (Emory, 1975 : 216-217). Dolphin hun-ng was probably undertaken from canoes at a with the aid of harpoons. Although no mplete harpoons have yet been recovered om Fa'ahia or Vaito'otia, a wooden object hich may be a harpoon foreshaft was reco-ered at Vaito'otia (Sinoto and McCoy, 975 : 169, Figure 7s), and a bone harpoon agment has been found (Sinoto, 1983a : 90). Harpoons occur in early East Polyne-an assemblages from the Marquesas to New aland, and both these areas have produced idence of dolphin hunting (Kirch, 1973 : 33 ; mith, n.d.b.). In addition, whalebone and ooden clubs have been recovered from this e, and could have been used as clubs for lphins rather than, or in addition to, their e as fighting weapons. Their *patu* shape es not rule out this possibility, as *patu* like efacts are thought to have been extensively d in the Chatham Islands as seal clubs (see utton and Marshall, 1980 : 44), though not ariably so (see Sutton, 1980 : 77). On the her hand, dolphins may be more difficult to l outright with a *patu* than seals.

The exploitation of domestic animals was early also an important aspect of subsis-nce. Dogs appear to have been killed hin the first year of life, and although y three pigs occur, these too were all killed this age. It is difficult to be sure how to interpret this. In some prehistoric ropean societies engaged in pig husbandry, ective culling of both young (less than 12 nths) and old individuals (greater than 24 nths) was practised (see Chaplin, 1971 : 5), leaving the breeding age group intact. ere is little guidance on this subject from nographic literature on the Pacific region. wever, Rappaport (1967) has reported for hlands Papua New Guinea people that bet-n one and two years is the optimum time pig trade and exchange. Archaeological dence from the Pacific, comparable to that from Huahine, is equally sparse. On Pakea, in the Banks Islands, a prehistoric assemblage shows a predominance of males of about 18th months age (Horton and Ward, 1981 : 10), and this seems to accord well with Rappaport's observation. By contrast, the prehistoric assemblage from Taumako in the Solomon Islands shows a dominance of individuals of less than 12 months (Smith, n.d.a.). It is possible that this pattern of selectively killing young pigs is evidence for hunting a feral population, rather than selective culling of domestic animals ; certainly feral pigs were present and hunted in the Society Islands in the 19th century (Oliver, 1974 : 281).

Analysis of fish bone.

The fish bone recovered was sorted and identified according to a method fully described elsewhere (Leach, 1976 ; Leach and Davidson, 1977 ; Leach, 1979 ; Leach and Ward, 1981 : 114ff) using the Otago Archaeological Laboratory comparative collection (about 300 species). In brief, select paired cranial bones (dentary, premaxilla, maxilla, articular and quadrate) and certain ' special bones ' which are diagnostic of particular species or families, are separated for identification. This method was developed for analysis of New Zealand fish bones in 1971.

An advance on earlier work involved the use of an interactive computer program during the identification process (Leach, n.d.). This places all information, cross-referenced to bag numbers, on a computer file, and minimum numbers are calculated automatically from stratigraphic information. The main data file (copies of the Huahine file can be obtained from the senior author on request) frequently contains identifications to a generic or species level, but only summary family level information is given here. This book-keeping system has the advantage that any errors can easily be corrected and alterations made on both the bag and the main data file, and minimum numbers recalculated automatically. It is also a permanent and closely documented record of every single identified bone, ensuring that others who may wish to check the work or extend the study (for example with bone measurements for particular species), may easily do so. No attempt is made to maximise minimum numbers by taking into account unmatched size pairs of individual anatomy.

The basic results are organised into family groups and major assemblages in Table 5 and

Figure 6, following Munro's classification (Munro, 1967). The diversity index, Shannon's H statistic, given in this Table and elsewhere in this paper is a statistic which has found wide application in problems of classification and pattern recognition (see for example Watanabe, 1972 : 562), and in ecological studies where species diversity is measured against environmental stress. It has also been used as an index of environmental quality (and lack of it) in areas of high pollution such as American estuaries (Headrich, 1975). When biomass units are employed instead of numbers the index has been used to measure the complexity of energy pathways in communities (Wilhm, 1968). The statistic has equally diverse applications in archaeology, particularly in studying the effects of human predation on resources (see Leach, 1978). It is calculated as follows :

$$H = -\sum_{i=1}^{q} (pi \cdot \log_2 pi)$$

Where q = the number of families represented ;
pi = the proportion of the ith family ;
NB : by using base 2 logarithms, H is given in binary digits (bits).

Layer	3	4	5	9	10	11	12	Total (%)
1 Thunnidae/Katsuwonidae		7	12	31	3			73 (19.6)
2 Carangidae		8	15	32	3			68 (18.2)
3 Scaridae	1	7	22	17	2	1		51 (13.7)
4 Epinephelidae	1	7	9	11	4		1	33 (8.8)
5 Lethrinidae	1	11	9	5	3		1	30 (7.8)
6 Lutjanidae		2	11	5	1	1		20 (5.4)
7 Balistidae		3	4	6	4	1		18 (4.8)
8 Holocentridae	1	1	6	3	1			11 (2.9)
9 Belonidae		2	1	4	1			9 (2.4)
10 Mesopteridae		1	1	2	1			8 (2.1)
11 Mullidae			1	2	1			7 (1.9)
12 Anguilliformes								7 (1.9)
Anguillidae		1	1	1				
Muraenidae		1	1	2				
13 Labridae		1	1	3	1			6 (1.6)
14 Sphyraenidae			2	1	1	1	1	5 (1.3)
15 Elasmobranchii		1	2	1	1			5 (1.3)
16 Diodontidae		1	1	1	1	1		5 (1.3)
17 Acanthuridae		1	2	1				4 (1.1)
18 Ostraciidae		1	1	1	1			4 (1.1)
19 Tetrodontidae		1		1	1			3 (0.8)
20 Megalopidae				2				2 (0.5)
21 Scorpaenidae				1				1 (0.3)
22 Exocoetidae				1				1 (0.3)
23 Chanidae			1					1 (0.3)
24 Hemiramphidae				1				1 (0.3)
25 Mugilidae					1			1 (0.3)
Totals	4	57	130	135	33	5	2	373

TABLE 5 Minimum numbers for Fa'ahia fish remains, arranged in order of decreasing abundance. The family numbers indicated here are used throughout this paper.

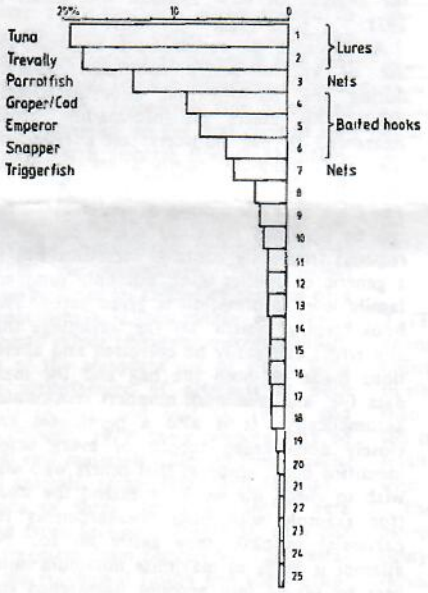


FIG. 6. — Fall-off abundance curve for fish from the Fa'ahia site. The family numbers follow Table 1. Common names and likely catch methods are indicated for the more important types of fish. Shannon's H statistic = 3.62. This indicates the disproportionate reliance on some types of fish. Note that the two most important families are both pelagic game fish.

Fish from 26 families were caught by these Huahine people. This is a comparable range to that of other known prehistoric Pacific fishermen. Only seven of these, however, could be said to have been major components in the catch (greater than 4 % of the total). This may be compared with 10 major types on both Nukuoro and Kapingamarangi (Leach and Davidson, n.d.), and nine on Palau (Masse, n.d.). This shows that the Huahine people were specialised in their approach to marine harvesting, and this is further indicated by the low value for Shannon's H statistic (see Table 6).

Assemblage	Shannon's H	Characteristics
Nukuoro	3.83	More generalised fishermen, though netting dominates.
Huahine	3.62	Specialised pelagic fishermen
Kapingamarangi	3.61	Specialised baited hook fishermen
Palau	3.45	Highly specialised net fishermen

TABLE 6 Shannon's H statistic for Huahine (pooled estimate) and other major fish bone collections in the Pacific.

Foremost in importance are fish of the Thunnidae/Katsuwonidae families, closely followed by the Carangidae. It will be seen from Figure 1 that the site is only 1 km from the open sea, and there is an entrance through the reef, known as *avamoa*, with its main channel passing close to Vaito'otia and Fa'ahia. The site is therefore ideally sited to take advantage of pelagic fish coming through the reef entrance in search of prey inside the reef. Tuna certainly come through reefs in

62), and in ecolo-
liversity is measu-
:ress. It has also
ıvironmental qua-
of high pollution
(Headrich, 1975).
ıployed instead of
ı used to measure
thways in comme-
he statistic has
; in archaeology,
effects of human
Leach, 1978). It

.log$_2$ pi)

of families repre-

ion of the ith

e 2 logarithms, H
in binary digits

re caught by these
comparable range
prehistoric Pacific
f these, however,
major components
4 % of the total).
th 10 major types
Kapingamarangi
d.), and nine on
s shows that the
ecialised in their
:sting, and this is
w value for Shan-
: 6).

atics
alised fishermen,
ting dominates.
d pelagic fishermen
d baited hook fishermen
cialised net fishermen

ne (pooled estimate) and
n in the Pacific.

: are fish of the
families, closely
ıe. It will be seen
is only 1 km from
e is an entrance
ıs *avamoa*, with its
: to Vaito'otia and
fore ideally sited to
'ish coming through
ı of prey inside the
ıe through reefs is

this way, though the carangids may have been resident inside the reef. Both forms of fish are attracted by a trolling lure, and this may have been the main method of capture.

It is thought that on some Pacific islands (Kapingamarangi and Nukuoro, see Leach and Davidson, n.d.), pelagic fish were largely caught on one-piece bait hooks, despite the archaeological occurrence of a few trolling lure shanks on these islands. Fishing for tuna with long line and baited hook has also been described for the Society Islands (Oliver, 1974 : 297). However, trolling lure shanks were also found in the Huahine excavations, and lure fishing is therefore the most likely catch method for these fish. A number of lure shanks have been found at both Vaito'otia and Fa'ahia, but all are unfinished, and no points have yet been found (Sinoto, pers. comm. 1984). It should not be forgotten, however, that any fish, including tuna, can be caught in nets too. These prehistoric people were certainly using nets (see below), and given the location of the settlement near a reef entrance, some pelagic fish are sure to have been caught in these nets. Just what proportion were netted and what taken with lures is an open question.

Next in importance in the fish catch are the scarids or parrotfish. These fish are largely herbivorous, though invertebrates, molluscs and coral are also eaten by them. Thus, baited hook and line fishing is unlikely to catch many of these fish. In many Pacific islands today, including Huahine, spearing is the dominant form of fishing, and scarids may be easily taken in this manner in just about any coralline location in fairly shallow water. This form of fishing is very efficient, but has been greatly assisted by small goggles introduced by Europeans. Spearing in prehistoric times is unlikely to have been anywhere near as productive as today, and was probably confined to shallow water around coral thickets. It is therefore suggested that these scarids were principally taken in nets.

Scarids are followed in abundance by three families of fish which are demersal or bottom feeders, and which largely live in deeper waters — Epinephelidae, Lethrinidae, and Lutjanidae. The only effective way of taking these fish is by use of baited hook and line, and in particular in deeper lagoon waters or outside the reef.

Finally, the Balistidae (Triggerfish) account for just over 4 % of the catch, and are judged to have been taken in nets, or during general foraging around coral thickets.

The relative importance of netting and baited line fishing may be assessed by comparing the number of scarids with those of the Epinephelidae family. This is presented in Table 7, with some other prehistoric catches as a guideline. This highlights the importance of netting for these Huahine people, though nowhere near as much so as for the fishermen on Palau. The figures are comparable to those for Nukuoro, where ethnographic data also attest the importance of communally owned nets. Of course this comparison takes no account of environmental differences between the islands, something which requires detailed local marine biological information, unfortunately not available. Even so, this comparison should show the approximate relative importance of these two catching methods, as fish of both families are abundant throughout the Pacific.

Assemblage	Groper/Cod	Parrotfish	Ratio	Characteristics
Kapingamarangi	231	231	1.00	Baited hook oriented
Huahine	33	51	0.65	Net oriented
Nukuoro	62	95	0.65	Net oriented
Palau	134	817	0.16	Net oriented

TABLE 7 Comparison of relative numbers of groper/cod and parrotfish for Huahine (pooled estimate) and several other major fish bone collections in the Pacific. This indicates the relative importance of baited hook fishing against netting.

It is difficult to be too precise about prehistoric catching methods (for a detailed discussion on this, see Leach and Davidson, n.d. and Masse, n.d.). Nevertheless, it is useful to group the fish catch into three categories as follow :

1) Pelagic predatory game fishes which are known to be attracted by lures, though they may have been taken by other techniques also (Families 1, 2, 9, 14).
2) Demersal fishes which feed in deeper water on the bottom, and which would be largely taken with baited hooks (Families 4, 5, 6, 10, 11).
3) Lagoon fish which can be taken by netting, spearing and general foraging in shallow water. In this category are also placed those fish thought to have been taken as opportunity arises, rather than as actual target species — for example, scorpion fish, and fish which are only minor components in the overall catch, such as flying fish, sharks and rays (Families 3, 7, 8, 12, 13, 15-25).

This grouping is presented in Table 8 and Figure 7. It will be seen from these that fishing for pelagic species was the major preoccupation of these Huahine fisherman. This characteristic of the assemblage is remar-

Assemblage	Pelagic	Demersal	Foraging
Huahine	155 (41.6)	97 (26.0)	121 (32.4)
Nukuoro	132 (19.3)	197 (28.8)	354 (51.8)
Kapingamarangi	149 (12.3)	408 (33.6)	657 (54.1)
Palau	97 (4.0)	643 (26.8)	1653 (69.2)

TABLE 8 Huahine fish remains (pooled estimate) grouped into three main catching methods, with other assemblages for comparison. Minimum numbers are given and percentages in brackets. See text for the list of families involved in each category for Huahine. See also Figure 7.

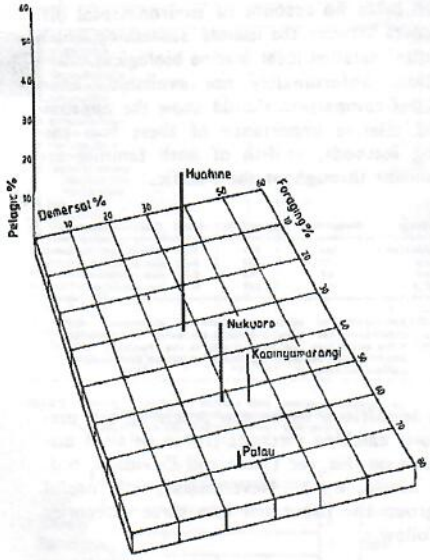


FIG. 7. — The three main fish catching methods for the Fa'ahia assemblage compared with several others from Pacific islands. Note the dominance of pelagic game fishes on Huahine.

kable compared with other known prehistoric fish catches in the Pacific. It is a pity that comparable information is not yet available for other parts of East Polynesia, the area most notable in the Pacific for its highly developed fishing technology. It therefore remains to be seen whether this bias on Huahine is unique or not. At present, it appears so.

Another interesting point is whether such a bias could be sustained over any period of time in a specific locality on an island. Given that tuna and barracouta come into lagoons from the surrounding ocean, and inshore stocks can therefore be replenished from a virtually limitless supply, these fish should not be depleted so rapidly by sustained inshore catching. On the other hand, many types of fish are known to quickly learn to avoid humans by adjusting their behaviour. The absence of wahoo, which may be primarily caught outside the reef in the open sea, supports the idea that many of the pelagic fish were taken inside the reef by the Huahine people. Wahoo certainly occur in other Pacific fish assemblages. On the other hand, ethnographic records for the Society Islands in the 19th century and later are rich with descriptions of tuna fishing outside the reef with trolling lures (see Oliver, 1974 : 299-303 for a survey of these descriptions). Although tuna and barracouta stocks may be relatively unaffected by human predation, fish of the Carangidae and Belonidae families may be. These fish are somewhat lower down the food chain, and are more frequently seen inside reef areas. Sustained exploitation of this more restricted resource may therefore eventually result in some depletion of stocks. The point should also be made that whereas catching tuna, barracouta, wahoo, and carangids is subject to a '*serendipity effect*' whereby advantage must be taken of unpredictable opportunities as the fish shoal into hunting packs, the same is not so for the Belonidae. Although these fish are not especially important in the Huahine assemblage (2.4 % of the total catch), some additional observations about these fish may be worthwhile, to highlight their distinctiveness in the pelagic category. In the 19th century, these fish were captured on Huahine by a highly specialised technique (Oliver, 1974 : 286-7), whereby a series of raft structures were used, and the fish frightened out of the water on to these by slapping the water with long sticks. Thus, these fish could be said to be targets of a deliberate hunting activity, with a reasonably predictable return for effort. Similarly, on modern Taumako, in the Solomon Islands, the Belonidae are caught at quite specific times of the day when they feed. Thus, expeditions are mounted for a short period in the early morning and at dusk over quiet waters in the lagoon to catch them while feeding. Two most effective techniques are employed :

1) A man stands in the front of a canoe with a long multipronged throwing spear, while the canoe is quietly manœuvred by a small boy seated in the rear. When a fish is seen it is speared, sometimes some distance from the canoe.
2) Special lures (*levele*) are made by carefully wrapping strands of tough web from the banana spider into a lure made of a short length of soft bark fibre (*ape*) which is very strong. These lures are attached either to cordage strung between two

moving canoes, or dab
use of a kite. The fis
the spider web entar
sharp teeth of the fis
fibre also becomes ent
allowing the fish to be

In the case of Belonio
their regular feeding hat
hunting can be suggested
of catching method wa
particular prehistoric gro
tion. Hunting the other
a deliberate strategy is r
because of their unpredic
In some other Pacific
has been suggested that s
subjects of avoidance be
Davidson, n.d.). Fish w
tified with this role are r
dae), puffer fish (Dioc
fish (Tetrodontidae), an
the Huahine collection,
might be made for avoi
eels, and this is only tent
four such eels were foun
(1.1 %) does seem very
rangi = 8.6 %, Nukuor
avoidance is thought to
Palau = 2.5 %). The
taken in very shallow v
rubble, and they are ple
of the site today (Sinoto,
so perhaps the few speci
not food items, but curio
for the other relevant f
low, but these fish are no
important food items an
of elasmobranchs are fe
expected, but differential
factor here. Unfortunate
distinguish between shark
the main anatomical c
found. Ethnographic rec
Islands (Oliver, 1974 : 2
vain suggestions of fish
19th century.
One fishbone was foun
ering (Figure 8). This
Pacific archaeological
bone is a left quadrate
Sphyraenidae (barracout
the species is uncertain it
and may be Agriopsp
As with the butchering m
these are fine cuts, su
sharp implement, such
There are at least 15 cut
are parallel, and occur on

itside the reef in
dea that many of
inside the reef by
)o certainly occur
nblages. On the
records for the
century and later
of tuna fishing
; lures (see Oliver,
' of these descrip-
barracouta stocks
t by human preda-
ae and Belonidae
ish are somewhat
and are more fre-
areas. Sustained
restricted resource
sult in some deple-
it should also be
; tuna, barracouta,
ubject to a '*seren-*
dvantage must be
)portunities as the
ks, the same is not
lthough these fish
nt in the Huahine
total catch), some
out these fish may
ht their distinctive-
/. In the 19th cen-
ired on Huahine by
que (Oliver, 1974 :
of raft structures
ightened out of the
ping the water with
ish could be said to
e hunting activity,
ictable return for
)dern Taumako, in
the Belonidae are
nes of the day when
itions are mounted
arly morning and all
the lagoon to catch
wo most effective
:

ront of a canoe with
rowing spear, while
nœuvred by a small
r. When a fish is
etimes some distance

are made by cane
of tough web from
) a lure made of a
irk fibre (*ape*) which
: lures are attached
trung between two

moving canoes, or dabbled in the water by use of a kite. The fish grabs the lure and the spider web entangles the numerous sharp teeth of the fish. The strong *ape* fibre also becomes entangled in the teeth, allowing the fish to be easily pulled in.

In the case of Belonidae, therefore, with their regular feeding habits, deliberate target hunting can be suggested, though what kind of catching method was employed by any particular prehistoric group is open to question. Hunting the other game fishes by such a deliberate strategy is much more difficult, because of their unpredictable occurrence.

In some other Pacific faunal collections it has been suggested that some fish species were subjects of avoidance behaviour (Leach and Davidson, n.d.). Fish which have been identified with this role are moray eels (Muraenidae), puffer fish (Diodontidae), porcupine fish (Tetrodontidae), and sharks. Amongst the Huahine collection, the only case which might be made for avoidance is for moray eels, and this is only tentative, since bones of four such eels were found. Four moray eels (1.1 %) does seem very few (cf. Kapingamarangi = 8.6 %, Nukuoro = 0.0 (deliberate avoidance is thought to have occurred here), Palau = 2.5 %). These animals can be taken in very shallow water amongst coral rubble, and they are plentiful in the vicinity of the site today (Sinoto, pers. comm. 1984), so perhaps the few specimens identified were not food items, but curiosities. The numbers for the other relevant families are similarly low, but these fish are not normally especially important food items anyway. The remains of elasmobranchs are fewer than might be expected, but differential survival may be a factor here. Unfortunately, it is not easy to distinguish between shark and ray vertebrae, the main anatomical component normally found. Ethnographic records for the Society Islands (Oliver, 1974 : 281-314) do not contain suggestions of fish avoidance in the 19th century.

One fishbone was found with signs of butchering (Figure 8). This is a rare find in Pacific archaeological assemblages. The bone is a left quadrate of a member of the Sphyraenidae (barracouta) family. Though the species is uncertain it is a large individual, and may be Agrioposphyraena barracuda. As with the butchering marks on the dolphin, these are fine cuts, suggesting some very sharp implement, such as a stone flake. There are at least 15 cuts on this bone ; all are parallel, and occur on the lateral surface ;

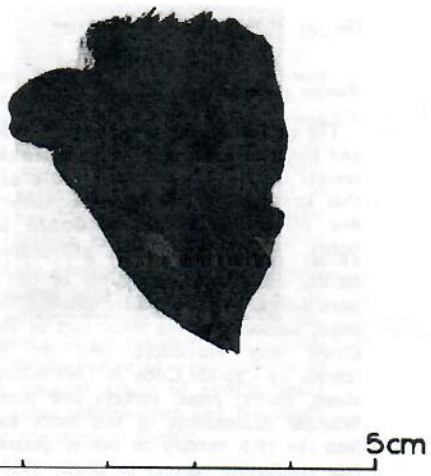


FIG. 8. — A left quadrate of a barracouta, showing butchering marks. About 15 parallel cuts are evident. These were made with a sharp implement, possibly a stone flake, and are parallel with the long axis of the fish. Deliberate cutting of the jaw muscles is indicated, possibly to open the fish's mouth to remove a trolling lure.

one is about 2 mm in depth, and this shows that the implement used was quite strong. The angle of the cuts is parallel to the long axis of the body, and they were forward of the operculum (gill cover). If the purpose of these cuts was to remove the head, they are in a very strange position and angle. The simplest way of removing a fish head is to cut behind the operculum and through the spine. Some species of fish have a substantial cheek musculature (such as the groper family), and this meat is considered a delicacy in some societies, and is removed separately. The cuts on this quadrate could be interpreted as an indication of cheek muscle removal ; however, the authors know of no ethnographic evidence supporting this interpretation in the case of barracouta. These muscles are the principal ones which close the dentary, and the preferred interpretation is that these muscles were cut to release the bite of a living animal. This might have been done to remove an especially valuable lure hook with safety from these vicious animals, which can strongly bite even when they have been out of the water for some time. Alternatively, this would be an effective way of rendering the fish harmless to bare feet in the confined space of a canoe.

of 19th century archaeological sites. Our suspicion is that excavation of such sites would reveal the disjunction between belief and action. Moreover, historical records (see Oliver, 1974 : 291, 293-4, 295) also stress the importance of hunting for dolphin fish (*Coryphaena equisetus* and *C. hippurus*), but these fish were of no apparent significance to the prehistoric people. It is hard to credit that stocks of turtles especially, and probably also dolphins and tuna, would not be profoundly depleted by a millennium of intensive hunting by an ever increasing human population on Huahine. Until some economic information is available from archaeological sites belonging to the 19th century, it would be wise to ignore the ethnographic descriptions as much as possible, as potentially misleading or irrelevant ; and concentrate on trying to understand the ancient archeological data in its regional environmental setting, and as if it were deposited by an anonymous cultural group. This approach has been taken in this paper, with only passing comments drawn from historical sources, and the main conclusions arrived at below should be seen in this light.

The people at Fa'ahia were an adventurous group, highly successful at harvesting marine resources, and in particular the fast swimming larger species, demanding a specialised ' hunting ' approach to their environment. Nearly 42 % of all fish taken are pelagic predators, and to this figure can be added the sizeable number of at least two species of turtle, and examples of dolphin. The pigs represented were young when killed, which might suggest selective hunting of feral animals, rather than killing of mature animals fattened in pens, as in established horticultural settlements in the Pacific. Even the dogs were selectively killed when young.

As well as the hunting of game fish, reptiles and mammals, there is clear evidence for use of nets in shallow waters, and baited line fishing in deeper areas, again requiring specialised equipment. Finally, there is a large group of animals which belong to the foraging category, where people take advantage of opportunities which periodically arise during specific hunting/fishing expeditions. To the many fish in this category can be added stranded pilot whales and/or sperm whales.

The suggested hunting mentality of these people is an unusual adaptation for a tropical Pacific island, and more akin to that of the inhabitants of temperate areas of the Pacific, such as New Zealand, where horticulture was either marginal or impossible. It may be that this approach to the environment was part of an initial exploitation strategy on an island only recently settled, perhaps without established gardens. It would be useful to examine archaeological evidence from a later period on Huahine, preferably from a nearby locality, where horticulture can more firmly be assumed and population was greater, to see if this hunting approach survived for any length of time. In the meantime, we are left with an isolated glimpse of what appears to be a most unusual group of people, more attuned to game animals than any previously observed in the tropical Pacific.

ACKNOWLEDGEMENTS.

Yosihiko Sinoto provided consumable laboratory costs involved in this research, together with an airline fare for Smith to use the Otago Archaeological Laboratory comparative collection ; Ms J. Sullivan assisted with sorting and identification of the reptile remains ; Dr Graeme Coote gave access to a nuclear microprobe for the fluorine analysis ; valuable advice on historical records for Huahine was given by R. Langdon, and on Huahine geomorphological matters by Dr J. N. Jennings. We would like to express our thanks for this assistance.

RÉSUMÉ

Le site de Fa'ahia et Vaito'otia est bien connu pour livrer des matériaux d'une culture semblable sous de nombreux aspects à ceux des occupations préhistoriques anciennes de Nouvelle-Zélande et à ceux des sites archaïques de Polynésie orientale. Au cours des fouilles, une vaste série ostéologique a été recueillie. Le poisson y prédomine avec des quantités significatives de tortues et de mammifères marins, suivis en quantités moindres d'espèces rapportées telles que cochon, chien et bovin. Les analyses à la fluorine indiquent que ce dernier est intrus.

Cet article présente les analyses des reconstitutions ostéologiques. Une forte présence des espèces pélagiques rapides est montrée, ce qui est en contraste marqué avec les autres reconstitutions du Pacifique. L'importante quantité de plusieurs espèces de tortues et de mammifères marins permettent d'élaborer l'image d'un groupe de gens dynamiques exploitant bien la récolte des ressources marines. Les chiens et les cochons étaient tués avant l'âge d'un an, suggérant une ponction sélective. Le

Bovine remains.

The excavation produced quite a few teeth and bones of adult cattle, distributed through several layers of the site. If it is assumed that stratigraphic mixing has occurred, only one animal would be represented by the bones. If the stratigraphic provenances are secure, the presence of bones of this European animal would seriously question the supposed antiquity of the main part of the site. Cattle were introduced into the Society Islands by Captain Cook in 1769 (along with sheep, ducks, geese, turkeys and peacocks). Whether descendants of this stock survived into the 19th century or not is questionable (see conflicting reports in Bligh, 1937 : 58, 378, 406) ; in any event, cattle were again introduced in 1817 from New South Wales (see Ellis, 1969 II : 198). Thus, the cattle bones in the archaeological site have to be later than 1769 in age. To try and shed some light on this matter, nuclear microprobe analysis was carried out on a tooth specimen to observe the fluorine uptake in the tooth as a test of temporal association with the remainder of the site. As a comparison, teeth of a dog and pig, more plausibly part of the prehistoric assemblage, were also examined. The fluorine and calcium profiles are shown in Figure 9. This clearly shows that the dog and pig have far more fluorine in them than the bovine tooth, suggesting that the cattle bones belong to a more recent period. Thus, the bovine remains may be assumed to be intrusive, and the antiquity of the main part of the site is confirmed.

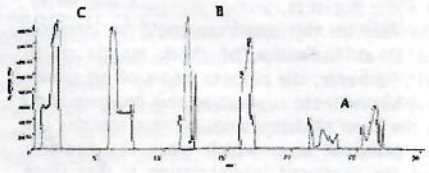


FIG. 9. — Calcium and fluorine profiles for a bovine tooth (A), dog (B), and pig (C). The much lower fluorine content in the bovine tooth demonstrates its more recent age. Even so, the fluorine content is very high, and the remains may be very early Historic period.

Disturbances by which cattle bones could have entered the site include large vertical land crab holes and small recent garbage pits. A few cattle were kept in the vicinity of the site by the landowners, before the land was leased to the hotel (Sinoto, pers, comm. 1984). The fluorine concentration in the teeth is significantly higher than would be expected for modern teeth. It is tempting to think that these remains may represent animals left on Huahine by Captain Cook, though this would be difficult to prove.

Discussion and conclusions.

Before reviewing the main conclusions arising from this study, a comment is needed about the approach adopted towards historical records on fishing in this region. The first point which needs to be made is that analysis of ethnographic information from historical records in purely economic terms is extremely difficult. For one thing, miscellaneous and unstructured observations about economic behaviour tend to be concentrated on the more spectacular activities of people, ignoring the mundane, but possibly more important, as far as household economics is concerned. It is simply not possible to accept such historical records at face value, and use them to reconstruct a 19th century household food energy budget with any reliability. Historical records on economic matters frequently describe what people believed to be important, rather than what people actually ate most of the time. This disjunction between belief and action is a gulf well known to anthropologists studying modern communities, and was especially clear in a recent study of ancient fishing on Kapingamarangi and Nukuoro. The species most talked about and most sought after when historical observations were made, were simply insignificant in the actual food energy budget. The relationship between field observation of living communities, and what is entombed in their archaeological sites is a complex one ; and archaeologists should not be surprised if this gulf emerges from analysis of material for which relevant historical information exists. What would be more surprising would be a case when no gulf appears after a comparative study. The Huahine archaeological assemblage provides such a case. Historical records from the Society Islands stress the importance of marine hunting for tuna and turtle, and these activities were also important economically to the ancient inhabitants. What we do not known is whether this hunting approach to marine resources was genuinely of comparable economic significance in later times and would be revealed by analysis

of 19th century archaeological sites. Our suspicion is that excavation of such sites would reveal the disjunction between belief and action. Moreover, historical records (see Oliver, 1974 : 291, 293-4, 295) also stress the importance of hunting for dolphin fish (*Coryphaena equisetus* and *C. hippurus*), but these fish were of no apparent significance to the prehistoric people. It is hard to credit that stocks of turtles especially, and probably also dolphins and tuna, would not be profoundly depleted by a millennium of intensive hunting by an ever increasing human population on Huahine. Until some economic information is available from archaeological sites belonging to the 19th century, it would be wise to ignore the ethnographic descriptions as much as possible, as potentially misleading or irrelevant ; and concentrate on trying to understand the ancient archeological data in its regional environmental setting, and as if it were deposited by an anonymous cultural group. This approach has been taken in this paper, with only passing comments drawn from historical sources, and the main conclusions arrived at below should be seen in this light.

The people at Fa'ahia were an adventurous group, highly successful at harvesting marine resources, and in particular the fast swimming larger species, demanding a specialised ' hunting ' approach to their environment. Nearly 42 % of all fish taken are pelagic predators, and to this figure can be added the sizeable number of at least two species of turtle, and examples of dolphin. The pigs represented were young when killed, which might suggest selective hunting of feral animals, rather than culling of mature animals fattened in pens, as in established horticultural settlements in the Pacific. Even the dogs were selectively killed when young.

As well as the hunting of game fish, reptiles and mammals, there is clear evidence for use of nets in shallow waters, and baited line fishing in deeper areas, again requiring specialised equipment. Finally, there is a large group of animals which belong to the foraging category, where people take advantage of opportunities which periodically arise during specific hunting/fishing expeditions. To the many fish in this category can be added stranded pilot whales and/or sperm whales.

The suggested hunting mentality of these people is an unusual adaptation for a tropical Pacific island, and more akin to that of the inhabitants of temperate areas of the Pacific, such as New Zealand, where horticulture was either marginal or impossible. It may be that this approach to the environment was part of an initial exploitation strategy on an island only recently settled, perhaps without established gardens. It would be useful to examine archaeological evidence from a later period on Huahine, preferably from a nearby locality, where horticulture can more firmly be assumed and population was greater, to see if this hunting approach survived for any length of time. In the meantime, we are left with an isolated glimpse of what appears to be a most unusual group of people, more attuned to game animals than any previously observed in the tropical Pacific.

ACKNOWLEDGEMENTS.

Yosihiko Sinoto provided consumable laboratory costs involved in this research, together with an airline fare for Smith to use the Otago Archaeological Laboratory comparative collection ; Ms J. Sullivan assisted with sorting and identification of the reptile remains ; Dr Graeme Coote gave access to a nuclear microprobe for the fluorine analysis ; valuable advice on historical records for Huahine was given by R. Langdon, and on Huahine geomorphological matters by Dr J. N. Jennings. We would like to express our thanks for this assistance.

RÉSUMÉ

Le site de Fa'ahia et Vaito'otia est bien connu pour livrer des matériaux d'une culture semblable sous de nombreux aspects à ceux des occupations préhistoriques anciennes de Nouvelle-Zélande et à ceux des sites archaïques de Polynésie orientale. Au cours des fouilles, une vaste série ostéologique a été recueillie. Le poisson y prédomine avec des quantités significatives de tortues et de mammifères marins, suivis en quantités moindres d'espèces rapportées telles que cochon, chien et bovin. Les analyses à la fluorine indiquent que ce dernier est intrus.

Cet article présente les analyses des reconstitutions ostéologiques. Une forte présence des espèces pélagiques rapides est montrée, ce qui est en contraste marqué avec les autres reconstitutions du Pacifique. L'importante quantité de plusieurs espèces de tortues et de mammifères marins permettent d'élaborer l'image d'un groupe de gens dynamiques exploitant bien la récolte des ressources marines. Les chiens et les cochons étaient tués avant l'âge d'un an, suggérant une ponction sélective. Le

RAPPAPORT, R. A., 1967. — *Pigs for the ancestors : ritual in the ecology of a New Guinea people*. Yale University Press, New Haven.

RUSSELL, S., 1935. — *Tahiti and French Oceania*. Pacific Publications Ltd. Sydney.

SALVAT, B., 1970. — L'Histoire des atolls racontée par leur faune. *Science, Progrès, Découverte*, n° 3423 : 17-23, Paris.

SILVER, I. A., 1969. — The ageing of domestic animals, p. 283-302. In : Brothwell, D. R. and Higgs, E. S. (Eds.) *Science in Archaeology*. Thames and Hudson.

SINOTO, Y. H., 1974. — A patu from Huahine, Society Islands. *Journal of the Polynesian Society* 83 (3) : 366-367.

SINOTO, Y. H., 1979. — Excavations on Huahine, French Polynesia. *Pacific Studies* 3 (1) : 1-40.

SINOTO, Y. H., 1982. — *A brief report on the 1981 excavations of Sections 3 and 5, Zone A, Fa'ahia site, Huahine island, French Polynesia*. Report submitted to the Territorial Government of French Polynesia. Bishop Museum, Honolulu.

SINOTO, Y. H., 1983a. — Archaeological excavations of the Vaito'otia and Fa'ahia sites on Huahine Island, French Polynesia. *National Geographic Society Research reports* 15 : 583-599.

SINOTO, Y. H., 1983b. — The Huahine excavation : discovery of an ancient Polynesian canoe. *Archaeology* March-April : 8-15.

SINOTO, Y. H. & T. L. HAN, 1981. — *Report on the Fa'ahia site excavation Zone « A » — Section 5 Fare, Huahine, Society islands, French Polynesia*. Bernice P. Bishop Museum, Honolulu.

SINOTO, Y. H. & P. C. MCCOY, 1975. — Report on the preliminary excavation of an early habitation site on Huahine, Society Islands. *Journal de la Société des Océanistes* 31 (47) : 143-186.

SMITH, I. W. G., 1976. — *Prehistoric fur seal exploitation on the south west coast of Chathnam Island*. Unpublished BA (Hons) thesis, Anthropology, University of Otago.

SMITH, I. W. G., 1979. — Prehistoric sea mammal hunting in Palliser Bay, p. 215-224. In : Leach, B. F. and Leach, H. M. (Eds.) *Prehistoric man in Palliser Bay*. National Museum of New Zealand Bulletin 21.

SMITH, I. W. G., n.d.a. — *Mammalian fauna from Taumako*. Unpublished manuscript, Anthropology Department, University of Otago.

SMITH, I. W. G., n.d.b. — *Sea mammals and prehistoric subsistence in New Zealand*. Unpublished PhD thesis. Anthropology, University of Otago.

SUTTON, D. G., 1980. — A culture history of the Chatham Islands. *Journal of the Polynesian Society* 89 (1) : 67-93.

SUTTON, D. G. & Y. M. MARSHALL, 1980. — Coastal hunting in the subantarctic zone. *New Zealand Journal of Archaeology* 2 : 25-49.

TALLANDIER, J., 1980. — Les tsunamis en Polynésie Française. *Bulletin de la Société des études Océaniennes* 17 (17, 210) : 593-616.

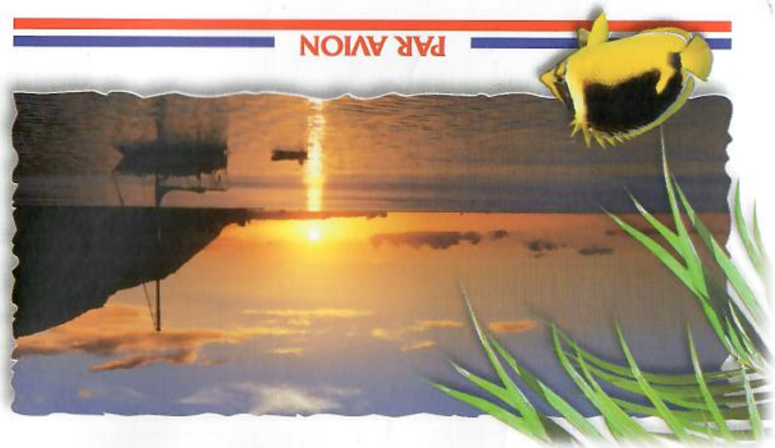
WATANABE, S., 1972. — Pattern recognition as information compression, p. 561-567. In : Watanabe, S. (Ed.) *Frontiers of Pattern Recognition*. Academic Press, New York.

WATSON, J. L., 1981. — *Sea guides to whales of the world*. Hutchinson, London.

WILHM, J. L., 1968. — Use of biomass units in Shannon's formula. *Ecology* 49 : 153-156.

WOOD-JONES, F., 1931. — The cranial characters of the Hawaiian dog. *Journal of Mammalogy* 12 (1) : 39-41.

Pacific Promotion Tahiti S.A. - www.tahitisouvenirs.com - 11 - 15/1 - L11
Imprimé en France



Expéditeur

3 507251 500015

5 NOVEMBER 2019
TE PUKA MARUIA
NAPUKA, TUAMOTU
FRENCH POLYNESIA

TE PUKA-TUAMOTU
4 11 2019

TEPUKAMARUIA-NAPUKA-TUAMOTU
4 11 2019

TO: GEORGE BALAIS
992 AWAAWAANDA PL.
APT. A
HONOLULU, HAWAII
96825 USA

5 NOVEMBER 2019

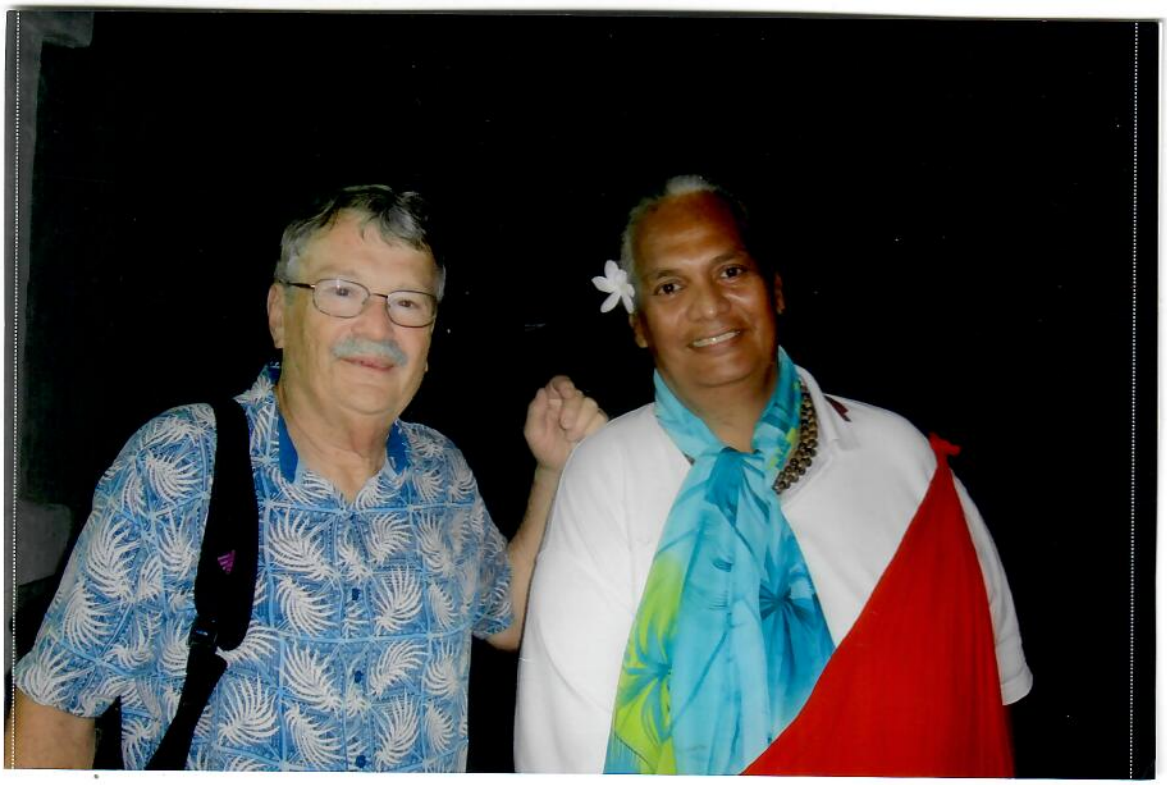
TE PUKA MARUIA

NAPUKA, TUAMOTU

FRENCH POLYNESIA

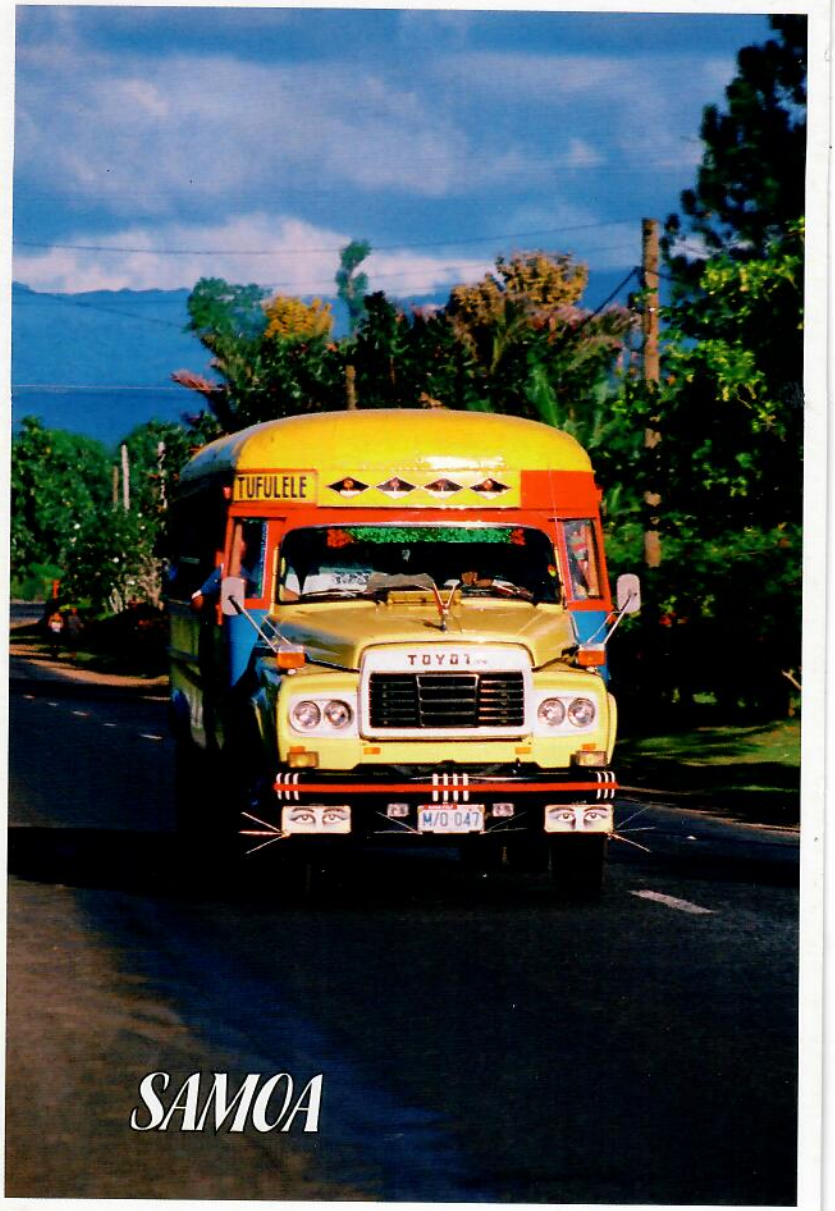
TEPUKAMARUIA-NAPUKA-TUAMOTU
4 -11
2019

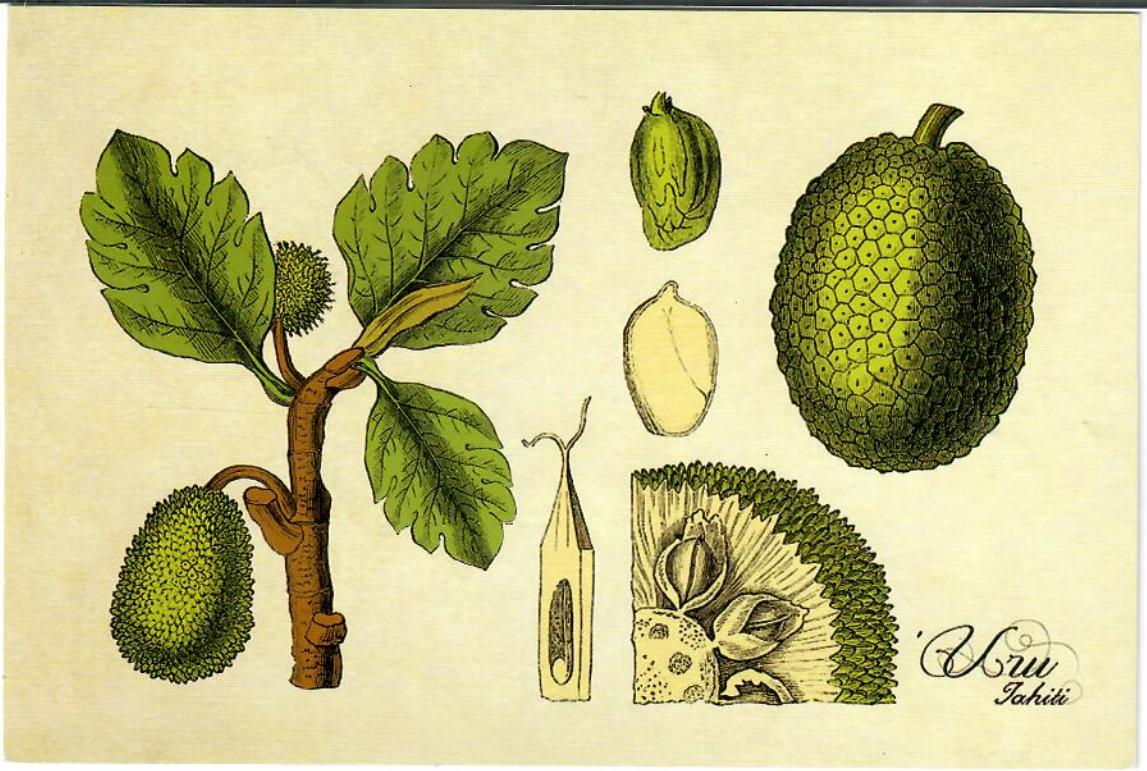
TO: GEORGE BALAZS
992 AWAAWAANOA PL.
APT. A
HONOLULU, HAWAII
96825 U.S.A.




MARINER
40


SAMOA


TUFULELE
TOYOTA
M/O 047
SAMOA



	5:39	6:52	7:32	8:32	9:59				13:59		15:52	1
			7:52	8:52							15:59	
PRINCE HINOI												
4:41	5:11	6:11	7:14	8:14	9:21	10:01	11:21	12:01	13:21	14:01	15:21	16
	5:41	6:54	7:34	8:34		10:41		12:41		14:41	15:54	16
			7:54	8:44								16
IMMEUBLE TE HONU												
4:43	5:13	6:13	7:16	8:16	9:23	10:03	11:23	12:03	13:23	14:03	15:23	16:
	5:43	6:56	7:36	8:36		10:43		12:43		14:43	15:56	16:
			7:56	8:56								16:
HOPITAL												
4:49	5:19	6:19	7:04	8:04	9:04	10:09	11:29	12:09	13:29	14:09	15:29	16:
	5:49		7:24	8:24	9:29	10:49		12:49		14:49		16:
			7:44	8:44								16:
												16:
RT7 FACE HOSPITEL												
4:51	5:21	6:21	7:06	8:06	9:06	10:11	11:31	12:11	13:31	14:11	15:31	16:

...ea Papara	40.57.67.56
...ete	40.81.91.33
...Paea	40.83.55.98
	40.43.36.68
...r Paea	40.53.34.73
...Papeete	40.82.92.82
	40.53.38.92
	40.43.38.81
	40.57.03.20
...vao	40.43.62.29
	40.82.01.14
	40.48.34.54
	40.82.48.48
	40.57.13.52
	40.43.68.99
...rira	40.45.10.16
...Paea	40.82.36.32
	49.85.04.21
	40.81.01.05
...ru Mahina	40.43.38.03
	40.42.55.96
	40.57.31.76
	40.83.11.76

TETUANUITEFARERII Julliano PK 47 c/mont Mataiea	40.57.64.88
TETUANUITEFARERII Tinorua Resid te ava uta Faaa	40.53.38.33
TETUAOHO Ginette PK 22 Orofero Paea	40.82.84.10
TETUARAA Marlene Lot Setil lot 61 PK 4.5 Faaa	40.43.00.69
TETUARII Celine Titioro Papeete	40.42.68.72
TETUARII Charles Punaauia	40.43.83.05
TETUARII Chirstophe PK 11.500 c/mont Pueu	40.57.09.52
TETUARII Heirua PK 23.8 c/mont Paea	40.85.66.45
TETUARII Hinarani PK 2.7 c/mer Afaahiti	40.43.07.09
TETUARII Mareta Cité de l'Air Faaa	40.81.97.31
TETUARII Mataarere PK 11.500 c/mont Pueu	40.42.36.72
TETUARII Michel PK 53 c/mer Papeari	40.57.09.76
TETUARII Noéline PK 13 c/mont Pueu	40.57.21.24
TETUARII Teata Pamatai Faaa	40.81.34.33
TETUAROA Guy PK 11,6 c/mont Pueu	40.57.03.13
TETUAROA Ivina PK 25,700 c/mont Paea	40.57.56.89
TETUAURA-EBB Vanina Lot Les Vallons d'Atima Mahina	40.42.59.18
TETUIRA Alain Pirae	40.42.37.53
TETUIRA Caroline Avenue Chef Vairaatoa Papeete	40.42.36.67
TETUIRA Eric Lot Reiatua Punaauia	40.43.39.55
TETUIRA Roselyne PK 11 Amoe lot N.6 Mahina	40.83.62.06
TETUIRA Rosida PK 60 Taravao	40.57.28.95
TETUIRA Tanemetua PK 25 c/mont Tiarei	40.83.30.32
TETUIRA Teamoarii PK 38.9 c/mer Papara	40.57.44.23

TEIVAROA Mélanie.

† 14.08.1960. 3e Etage. 17Q 4. F/Bas.

Née à Paea le 12.08.1960.

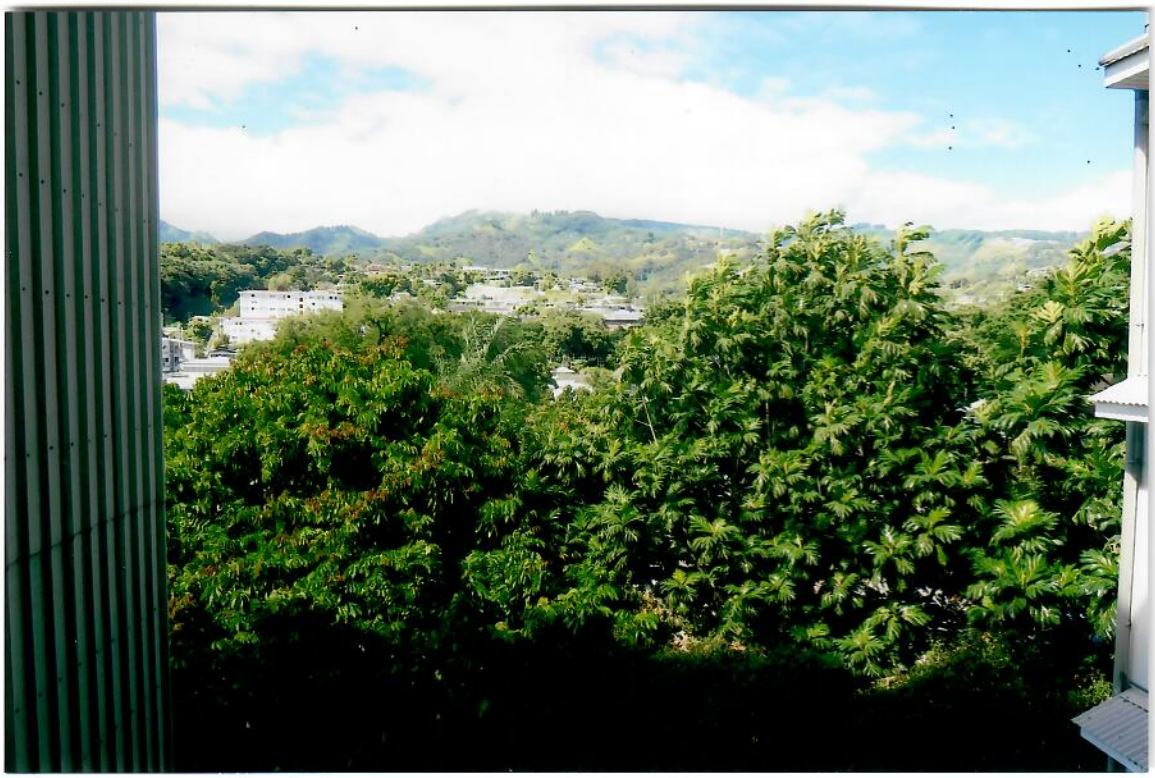
Fille de Tara TEIVAROA et de Mélanie

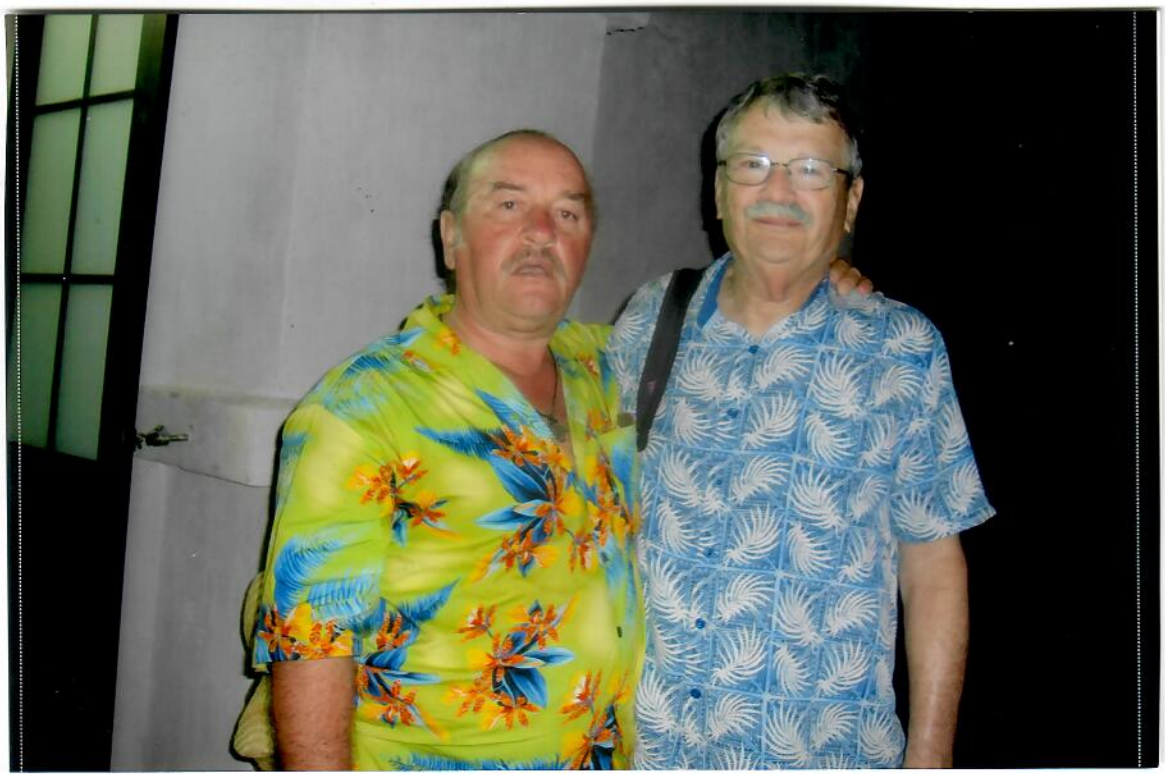
Hunarii a FAATONO (épx DcD).

To
George Balazs
992-AWAAWAANOA PL.
HONOLULU
HAWAII 96825
96825
U.S.A.

POSTCODE

Abs. Johann Müller
98772 Naplika Tuamotu
Polynesi Francaise





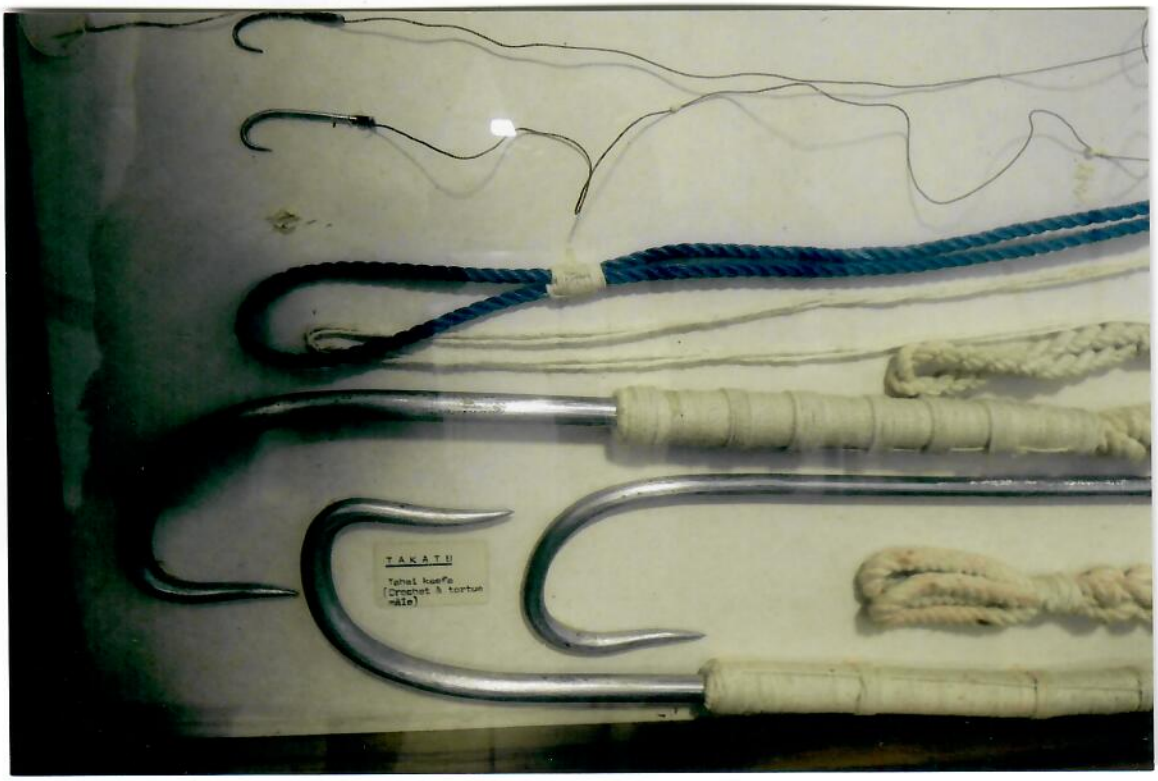

TAKATU
Tohai kaafe
(Crochet à tortue
mâle)

Fig.5.1 : Reconstitution d'une cérémonie de consommation rituelle


NESTLE
TOLL HOUSE

USEFUL INFORMATION

CONVERSION TABLE

METERS	YARDS	INCHES
1.000	1.093	39.37
0.914	1.000	36.00

CENTIMETERS	INCHES	FEET
1.00	0.394	0.0328
2.54	1.000	0.0833
30.48	12.000	1.0000

KILOMETERS	MILES
1.000	0.621
1.609	1.000

GRAMS	OUNCES	POUNDS
1.00	0.035	0.0022
28.35	1.000	0.0625
453.59	16.000	1.0000
1,000.00	35.274	2.2050

KILOGRAMS	OUNCES	POUNDS
1.000	35.274	2.2050
0.028	1.000	0.0625
0.454	16.000	1.0000

LITERS	PINTS	QUARTS	GAL.
1.000	2.113	1.057	0.264
0.473	1.000	0.500	0.125
0.946	2.000	1.000	0.250
3.785	8.000	4.000	1.000

LENGTH

1 meter (m) = 100 cm	=	1,000 mm
1 milimeter (mm)	=	0.001 m
1 centimeter (cm)	=	0.01 m
1 decimeter (dm)	=	0.1 m
1 decameter (dkm)	=	10 m
1 hectometer (hm)	=	100 m
1 kilometer (km)	=	1,000 m

CAPACITY

1 liter (l) = 100 cl	=	1,000 ml
1 mililiter (ml)	=	0.001 l
1 centiliter (cl)	=	0.01 l
1 deciliter (dl)	=	0.1 l
1 decaliter (dkl)	=	10 l
1 hectoliter (hl)	=	100 l
1 kiloliter (kl)	=	1,000 l

WEIGHT

1 gram (g) = 100 cg	=	1,000 mg
1 miligram (mg)	=	0.001 g
1 centigram (cg)	=	0.01 g
1 decigram (dg)	=	0.1 g
1 decagram (dkg)	=	10 g
1 hectogram (hg)	=	100 g
1 kilogram (kg)	=	1,000 g

Table of Time Measure

60 seconds	= 1 minute
60 minutes	= 1 hour
24 hours	= 1 day
7 days	= 1 week
30 days	= 1 calendar month
12 months	= 1 year
365 days	= 1 common year
366 days	= 1 leap year
100 years	= 1 century

Table of Dry Measure

2 pints (pt.)	= 1 quart (qt.)
8 quarts	= 1 peck (pk.)
4 pecks	= 1 bushel (bu.)
1 cord	= 128 cu. ft.

Table of Liquid Measure

4 gills (gl.)	= 1 pint (pt.)
2 pints	= 1 quart (qt.)
4 quarts	= 1 gallon (gal.)
31-1/2 gallons	= 1 barrel (bbl.)
2 barrels	= 1 hogshead (hhd.)

Table of Paper Measure

25 sheets	= 1 quire
20 quires	= 1 ream
10 reams	= 1 bale

Table of Linear Measure

12 inches	= 1 foot
3 feet	= 1 yard
5-1/2 yards	= 1 rod
40 rods	= 1 furlong
8 furlongs (5280 ft.)	= 1 mile

Miscellaneous Measures

12 units	= 1 dozen
12 doz.	= 1 gross
12 gr.	= 1 great gross
20 units	= 1 score
1 hand	= 4 inches
1 fathom	= 6 feet
1 knot	= 6076 feet/hour
3 knots	= 1 league/hour
1 bu. potatoes	= 60 lbs.
1 barrel flour	= 196 lbs.
1 cu. ft. of water	= 7.48 liquid gals. and weighs 62.425 lbs.

Diameter of circle x 3.1416 = circumference
Atmospheric pressure is 14.7 lbs. per sq. in. at sea level
13-1/2 cu. ft. of air weighs 1 lb.

Table of Cubic Measure

1728 cubic inches	= 1 cubic foot
27 cubic feet	= 1 cubic yard
128 cubic feet	= 1 cord of wood
24-3/4 cubic feet	= 1 perch of stone

Note: A cord of wood is a pile 8 feet long, 4 feet wide, and 4 feet high.
A perch of stone or brick is 16-1/2 feet long, 1-1/2 feet wide, and 1 foot high.

Table of Avoirdupois Weight

16 drams	= 1 ounce (oz.)
16 ounces	= 1 pound (lb.)
100 pounds	= 1 hundred-weight(cwt.)
2000 pounds	= 1 ton (T.)
2240 pounds	= 1 long ton(L. T.)

Table of Troy Weight

24 grains (gr.)	= 1 penny-weight (dwt)
20 penny-weights	= 1 ounce (oz.)
12 ounces	= 1 pound (lb.)

Table of Circular Measure

60 seconds	= 1 minute
60 minutes	= 1 degree
360 degrees	= 1 circumference

A degree of the earth's surface or a meridian = 69.16 miles at the equator.

Table of Apothecaries' Weight

20 grains (gr.)	= 1 scruple
3 scruples	= 1 dram
8 drams	= 1 ounce
12 ounces	= 1 pound (lb.)

Table of Surface Measures

144 sq. in.	= 1 sq. ft.
9 sq. ft.	= 1 sq. yd.
30-1/4 sq. yds.	= 1 sq. rod
160 sq. rods	= 1 acre
640 acres	= 1 sq. mile

An acre measures 208.71 ft. on each side.
A section of land is 1 sq. mile.
A quarter section is 160 acres.
A township is 36sq. miles.

MULTIPLICATION TABLE

	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

80 SHEETS Wide Ruled
Composition Book

WEXFORD™

DISTRIBUTED BY: WALGREEN CO.
200 WILMOT RD., DEERFIELD, IL 60015
100% SATISFACTION GUARANTEED
walgreens.com
©2016 Walgreen Co.

MADE IN VIETNAM

9.75 IN X 7.5 IN / 24.8 cm X 19.1 cm