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A CAROLINE ISLANDS SCRIPT

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BY SAUL H. RIESENBERG and SHIGERU KANESHIRO ¹

INTRODUCTION

The existence of a peculiar system of writing in the Woleai Islands ² has received almost no attention from ethnologists or paleographers, and none at all from linguists. It is a script which, the present writers are convinced, has developed in consequence of stimulus diffusion, to use Kroeber's term, and as such is to be reckoned among the small number of scripts so originating, such as the Bamun ideographic script and the Vai and Cherokee syllabaries. It is the purpose of this paper to explain its origin and development and to analyze its form, content, and use.

TYPE 1 SCRIPT

The first published notice of a Caroline writing was made by J. Macmillan Brown (1914, pp. 89-91; 1927, pp. 117-120). In 1913 he paid a brief visit to Woleai atoll, where a chief, Egilimar by name, wrote for him a sentence in the native script; later he received a list of 51 characters and their phonetic values. Brown did not inquire into or was not told anything of the origin of the writing. The list is reproduced here in column B of figure 25. It is the type of writing which we will refer to hereafter as Type 1. As Brown points out, the symbols do not resemble those of any system known from elsewhere.

The script is now known only to five men on the islet and to some in Faraulep, an islet a hundred miles distant. But it is probably a relic of a wide usage in the archipelago. There is no possibility of any one of the five having invented it. . . . This Oleai script is manifestly the product of long ages for the use of the

¹ The authors are indebted to Drs. A. L. Kroeber and Willam Sturtevant for advice and criticism, to Dr. Y. Uyehara for assistance with Japanese characters, to Dr. Ward Goodenough for advice on Trukese linguistics, to Dr. S. H. Elbert for critical reading of the text and for assistance with tape recordings, and to Mr. Frank Mahony who obtained considerable information incorporated in the text from Truk and surrounding islands. Several students from Micronesia at the University of Hawaii were also of much help, among them Tosiwo Nakayama of Truk, Bethwel Henry and Bailey Olter from Ponape, Nicholas Leon y Guerrero from Saipan, Edmund Gilmar from Yap, and David Ramarui from Palau.

² The term "Woleai" as generally used has two meanings: Woleai atoll itself; and the whole Woleai group in the Central Carolines, consisting of Woleai atoll, Eauripik, Ifaluk, Faraulep, Gaferut, Olimarao, Elato, Lamotrek, West Fayu, Satawal, and Pikelot. Of these islands, Gaferut, Olimarao, West Fayu, and Pikelot are uninhabited. The group is often referred to also as simply "the Woleai." Just to the east of the group lie Puluwat, Pulusuk, and Pulap, known today at Truk as "the Western islands;" we will be concerned in this paper with Puluwat.

Explanatory notes for figure 25

Column

- A. Numbers assigned to characters and used in text. Numbering after Brown's sequence, 1 to 51, and arbitrarily thereafter.
- B. Brown (1927, p. 118). Brown's sequence, characters, and attributed values. Woleai, 1913.
- C. Damm (1938, fig. 279). Sequence and characters from wooden board. Faraulep, 1909.
- D. Damm (1938, fig. 280). Characters from beams of men's house. Faraulep, 1909.
- E. Krämer (1937, pl. 15 and fig. 109). Characters from canoe and bamboo box. Woleai, 1909.
- F. Damm and Sarfert (1935, figs. 128, 272). Characters from tinderbox and flute. Satawal and Puluwat, 1909.
- G. Someki (1936, fig. 5, p. 178; 1945, figs. 189, 230). Characters and attributed values. Presumably Faraulep, Ifaluk, and Elato, 1934.
- H. M. of Pigue, Faraulep, 1954. Sequence, characters, and attributed values in Smith's orthography.
- I. } C. of Pigue, Faraulep: 1955A, 1955B, and 1956. Sequence, characters,
 J. } and attributed values; attributed values of column J in Smith's orthography.
 K. }
- L. L. of Pigue, Faraulep, 1957. Characters and attributed values.
- M. N. of Pigue, Faraulep, 1957. Characters and attributed values.
- N. } R. of Ifaluk; 1955 and 1957A. Sequence, characters, and attributed values
 O. } in Smith's orthography.
- P. } T. of Lamotrek; 1955 and 1957. Sequence, characters, and attributed
 Q. } values in Smith's orthography.
- R. B. of Falalap, Woleai, 1957. Sequence, characters, and attributed values.
- S. A. of Falalap, Woleai, 1957. Sequence, characters, and attributed values.
- T. S. of Ifaluk, 1955. Characters.

REMARKS

1. Positions in sequence of column A assigned to characters in columns D, E, F, G, L, M, and T by comparison of form of character, and of value if given, with form and value of characters of the other columns.
2. Bracketed characters are those not given in informants' lists but occurring in word samples; or are variant forms from word samples.
3. Values in columns B and G are as given by Brown and Someki respectively. Attributed values in columns H, J, N, O, P, and Q are based on hearing of tape recordings and are in Smith's orthography, except those in parentheses, which were heard under hurried field conditions. Attributed values in columns I, R, and S, in parentheses, not taped; are given as roughly recorded in field. Attributed values in columns K, L, and M, in parentheses, not taped; values were written by these informants in Japanese *katakana*, and are here shown in the orthography used by Prof. Y. Uyehara of the University of Hawaii, who has transcribed the *katakana* characters for us.*
4. Underlining of numbers in various columns indicates the place up to which informants' sequences match the sequence of Brown (column B).

*The *katakana* used by Woleai natives is a quite unorthodox one, and some of the combinations used are apparently intended to form sounds impossible in Japanese. Thus, the device known as *nigori* or *chonchon*, used in Japanese writing to transform a character representing a surd consonant into a sonant consonant, is used by C. and N. (columns K and M) for various other purposes; e. g., it is used by both C. and N. as part of values of characters 21, 22, and 34, and seems to be intended in these instances to convert *m* to *mw* or *r* to *rw*; in other cases it is apparently meant to achieve vowel values intermediate between two Japanese ones (e. g., characters 9, 10, 31, 57). Various combinations of *katakana* characters are transliterated by us with hyphenated values, and seem also to be intended to form vowels absent in Japanese.

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A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T		
1	1X na	1X					1X(X X) na	1X(na)	1X na	1X(na)	X(na)		1X na	1X na	1X na	1. X na	1X(na)	1X(na)	X	1.	
2	2Tgoo	2j		T			2 T(1) ko	2 T(ko)	2T ko	2 T(ko)	T(ko)	T(ko)	2. T ko	2 T ko	2 T ko	2 T ko	2 T(ko)	2 T(ko)	T 1	2	
3	3Xdda	3W	W	W	W	W to	3 W ta	3 W(ta)	3 W ta	3 W(ta)	W(ta)		3 W ta	3 W ta	3 W ta	3 W ta	3 W(ta)	3 W(ta)	W	3	
4	4Xba	4W	W	W	W	X fuo	4 W(X) be	4 W(bwe)	4 Wbae	4 W(pe)	X(pe)		4 X bae	4 X bae	4 X bae	4 X bae	4 X(pwe)	4 X(pwe)	X X	4	
5	5Qtschroa	5Y					5 Q(Δ)choa	5 Q(cho)	5 Q cho	5 Q(cho)		Q(cho)	5 Q cho	5 Q cho	5 Q cho	5 Q cho	5 Q(cho)	5 Q(cho)	Q Δ	5	
6	6fnōa	6j					6 f noa	6 f(nō)	6 f no	6 f(na)	f(na)		6 f no	6 f no	6 f no	6 f no	6 f(na)	6 f(noa)	f j	6	
7	7Xpu	7X				X fu	7 X bi	7 X(pw)	7 X bi	7 X(bi)		X(pu-i)	7 X bi	7 X bi	7 X bi	7 X bi	7 X(pwi)	7 X(pwi)	X	7	
8	8Pru	8d			P		8 P ru	8 P(ru)	8 P ru	8 P(ru)	P(ru)		8 P ru	8 P ru	8 P ru	8 P ru	8 P(ru)	8 P(ru)	P	8	
9	9ma	9W				W ma	9 < ma	9 >(ma)	9 > ma	9 >(ma-ma)		>(mā)	9 < ma	9 < ma	9 < ma	9 < ma	9 <(maa)	9 <(mā)		9	
10	10Cbu	10P					10 C poe	10 C(pō)	10 C poe	10 C(po-e)		C(pō)	10 C poe	9 C poe	9 C poe	10 C poe	10 C(pō)	10 C(pō)	C	10	
11	11Mmā	11W	W	W	W		11 M(W)mae	11 M(me)	11 Mmae	11 M(me)	M(me)	M(me)	11 M	10. M mae	13 W mae	11 M mae	11 M(me)	23 M(me)	M W W	11	
12	12Nngū	12W	W	W		V nga	12 N(N)I	12 N(ngē)	12 Nngae	50 N(ngē)		N(n-ge)	12 Nngae	11. Nngae	14 N ngae	12 N ngae	12 N(ngē)	12 N(ngē)	N N N	12	
13	13Qboa	13Q					13 Q(b) bo	13 Q(po)	13 Q ba	13 Q(po)		Q(po)	13 Q bo	12 Q bo	15 Q bo	13 Q bo		13 Q(po)		13	
14	14Warr	14j			F	Q wo	14 W(R)wa	14 Q(wa)	14 Q wa	14 Q(wa)	Q(wa)		14 R wa	13 R wa	16 Q wa	14 Q wa		14 Q(wa)	Q j	14	
15	15Pāa	15j		j		Q ra	15 P ra	44 Q(rā)	15 Q ra	15 Q(rā)	Q(rā)	Q(rā)	15 P ra	14 P ra	17 Q ra	15 Q ra		15 Q(rā)	Q j	15	
16	16Yuh	16A	Yh			Y u	16 Y(A)uu	16 Y(u)	16 Y uu	16 Y(i-yu)	Y(yo)		16 Y uu	15 Y uu	18 Y uu	16 Y uu	[Y]	16 Y(uh)	Y	16	
17	17Cda	17C				() to	17. () ta	17()to	17() to	17()to		()to	17() ta	16() to	19 C to	17 C to		17()to	()	17	
18	18tschra	18j				V pa	18 ts cha	18 ts(cha)	18 ts cha	18 ts(cha)		ts(cha)	18 ts sha	17 ts cha	20 ts ta	18 ts cha		18 ts(cha)	ts j	18	
19	19Δmā	19W				Q che	19 Δ mwe	19 V(mwe)	19 V mwoe	19 V(mo-e)		V(mo-e)	18 Δ mwe	19 V mwe	19 V mwe	19 V mwe		19 V(mwe)	V	19	
20	20Xtschū	20W			W	Q che	20 X (P)che	20 X(che)	20 Xchoe	20 X(che)		X(che)	19 Xchoe	20 Xchoe	20 Xchoe		[X]	20 X(che)	X	20	
21	21Fmā	21j				Q nma	21 F(m)ma	21 F(ma)	21 F mma	21 F(ma)		F(ma)	19 F mma	22 F mma	21 F mma		[F]	21 F(ma)	F	21	
22	22Yro	22j					22 F ro	22 F(ro)	29 F ro	22 F(ro)		F(ro)	20 F ro	21 F ro	22 F ro			22 F(ro)	F j	22	
23	23Cma	23j				W ma	23 C(m)ma	56 C(ma)	51 C ma	23 C(ma)	C(ma)		21 C(m)ma	20 C mma	9 C ma	23 C ma			C j	23	
24	24Qba						24 Q baa	47 Q ba	24 Q(ba)			Q(pal)		56 Q					Q	24	
25	25Qra						25. Q(Δ)te	36 Q tae	25 Q(te)		Q(te)		[Q]toe					[Q]	Q	25	
26	26Ppā	24B					26. B pe	29 B(pō)	42 B pae	26 B(pe)		B(pe)	22 B pae	23 B pae	10 B pae	24 B pae		24 B(pe)	B	26	
27	27Xvōa	25X		X	X		27. X fo	50 X(fa)	41 X fa	27 X(fwo)		X(fa)	23 X fa	24 X fa	11. X	25 X fo		X	X	27	
28	28tschrū					ts tu	28. ts chuu	80 ts chuu	28 ts(chu)		ts(chu)		57 ts chuu						ts chuu	ts	28
29	29Xpu	26W				Q pa	29 X buu	36 X(puw)	46 X bu	29 X(pu)		X(pū)	24 X pu	25 X bu	12. X	26 X bu		25 X(puu)	X	29	
30	30Cūā	27Q				Q na	30 C noe	64 C(nō)	69 C noe	30 C		Q(tō)	25 C noe	26 C noe		27 C noe		26 C(nō)	C	30	
31	31Pūh	28Q					31. Q tuu	[8]	77 Q tuu	31 Q(te-yu)		Q(tō)	26 Q tuu	27 Q tuu		28 Q tuu		27 Q(tū)	Q	31	
32	32Hva	29W				H pa	32 H fa	60 H(fa)	75 H fa	32 H(fa)		H(fa)	27 H fa	28 H fa		29 H fa		28 H(fa)	H	32	
33	33Jla					je	33. L(J)ne	37 L(J)ne	33 J(ne)		J(ne)		28 J nae	29 J nae		30 J nae		29 J(ne)	J	33	
34	34Kmai						34 K(m)maa	[k]	34 K(maa)	34 K(myo)		K(mā)	29 K maa	30 K maa		31 K maa		30 K(maa)	K	34	
35	35Xrō					X re	35. X re	38 X(rre)	71 X rae	80 X(re)	X(re)	X(re)	30 X rae	31 X rae		32 X rae		31 X(rre)	X	35	
36	36Xlūh					X nu	36 X(l)nuu	62 X(nū)	37 X nuu	35 X	X(nū)		31 X nuu	32 X nuu		33 X nuu		32 X(nu)	X	36	
37	37Xstoh					W sa	37. W(I)sha	79 W sa	36 X			W(se-a)	32 W sa	33 W sa		34 W sa		33 W(sal)	W	37	
38	38Xtō					X ta	38. X ta	28 X(tō)	22 X toe	37 X		X(tō)	33 X toe	34 X toe		35 X toe		34 X(tū)	X	38	
39	39Xwā					X we	39 X(w)we	30 X(we)	59 X wae	78 X(e)	X(e)		34 X wae	35 X wae		36 X wae		35 X(we)	X	39	
40	40Xschō					X shia	40. X(S)shie	78 X sae	39 X(se)		X(se)		35 X shae	36 X shae		37 X shae		36 X(se)	X	40	
41	41Xkū					X ku	41. X ku	23 X(kū)	40 X kuu	40 X(k-yu)		X(kū)	36 X kuu	37 X kuu		38 X kuu		37 X(kū)	X	41	
42	42Xsōā					X sho	42. X sho	66 X(shal)	58 X sho	41 X(so)		X(so)	37 X shoa	38 X shoa		39 X sho		38 X(sō)	X	42	
43	43Qbag					X ku	(6) Q(b) pa	68 Q(pa)	57 Q pa	42 Q(pa)		Q(pe)	38 Q pa	39 Q pa		40 Q pa		39 Q(paa)	Q	43	
44	44Xku					X ku	[X] (ku)		67 X ku	43 X(kū)		X(kū)	54 X ku			18 X(kū)		40 X(kū)	X	44	
45	45Xschrō					X ka	(D) X(ka)	39 D(X)ka	35 M ka	45 M(ka)	X(ka)		39 X ruu	40 X ru		43 X ri		19 X(chō)	X	45	
46	46Xgkaa					X lu		27 X(ruw)	54 X ruu	46 X(ru)		X(rū)	39 X ruu	40 X ru		43 X ri		20 X(ka)	X	46	
47	47Xrū					X lu		[X] X	64 X nga	47 X(nga)		X(nga)	44 X nga	45 X ngae		22 X(nga)		21 X(rū)	X	47	
48	48Xngo											X(nga)	44 X nga	45 X ngae		22 X(nga)		X	X	48	
49	49Qmā						[Q] (ma)	32 Q(ma)	62 Q mwa	48 Q(ma)	Q(mā)		45 Q kae	46 Q mwa		[Q] (ma)		45 Q(ma)	Q	49	
50	50Q(6)gā						[Q] (ha)	51 [Q] (ka)	48 Q kae	49 Q(ke)			45 Q kae	46 Q kae				[Q] (ha)	Q	50	
51	51X du						[X] (tu)	61 X(tu)	34 X tu	85 X(tō)	X(tō)	oto	[+o] (cha)	59 oto sa				[X] (tu)	X	51	
52							[Q] (nga)	33 Q(nga)	63 Q nga		Q(ngo)		40 Q ngaa	41 Q ngaa		44 Q ngo		46 Q(ngo)	Q	52	
53								40 Q(fwa)	25 Q ngaa	55 Q(fwa)										53	
54								41 X(choa)	24 X choa	65 X(cho)	X(cho)								X	54	
55							[X] (chu)	47 X(chu)	30 X(shu)		X(sū)								X	55	
56						X ka	[X] (kō)	52 Q(kō)	58 Q koe	75 Q	Q(kuo)	[Q]						51 Q(ko)	Q	56	
57								53 X(sō)	70 X shoa	76 X(shi-e)										57	
58								54 T(ngū)	73 T nguu	69 T(ng)	T(n-gu)	51 T nguu	49 T ngae						T	58	
59								55 X(puy)	72 X bi	88 X T(puy)			43 T puu	44 T bu					X	59	
60								67 X(itaw)	68 X toa	53 X(tō)		X(tō)	42 X te							60	
61							[X] (shu)	[N] (ku)			X(bū)		41 X shu	53 X chu					42 X(su)	61	
62							[X] (sū)		39 X sv	51 X(su)	X(shu)			42 X shu					44 X(sū)	62	
63									60 X paa	67 X(pō)										63	
64								61 X(ng-e)	57 X(ng-e)										41 X(nga)	64	
65							X nu	[X] (nuw)	66 X nu	54 X(nu)	X(nū)		46 X nu	47 X nu						65	
66							X puo	[X] (fa)		64 X(fe)	X(fe)		[X] (fae)		[X] (fae)				X	66	
67							X mu		74 X mw				47 X mw	51 X mw						67	
68							X shia				X(se-o)		[X] X							68	
69																				69	
70																				70	
71							X tu		69 X(chu)	65 X chu	X(nu)								X	71	
72											X(ue)									72	
73							F ta				F(mu)								F	73	
74																				74	
75																				75	
76																				76	
77							X na				X(nō)	[X] (noa)							X	77	
78							X nma													X	78

FIGURE 25.—Type 1 symbols and values.

(For explanation, see opposite page.)

organisers of a highly-organised community of considerable size. In other words it must have belonged to the ruling class of an empire of some extent, that needed constant record of the facts of intercourse and organisation.³

There are some scattered references to Brown's discovery, but few writers have commented on it even briefly. Mason (1920, p. 152) accepts Brown's opinion, quoted above, uncritically. Diringer (1948, p. 448), agreeing in part with Brown, states that

the origin of the Woleai script is perhaps in some way connected with the Further Indian branch of scripts, although this connection does not appear evident, either from the graphic or from the phonetic points of view. There is, however, the possibility of the mixed process of invention and borrowing, called "idea diffusion."

And Imbelloni (1951, p. 164 and fig. 25), in an attempt to link the script to Easter Island writing and other scripts of his "Indo-Pacific" graphic system, refers to it as being based on Semitic syllabaries and having diffused to the Carolines via India and Malaya; he too regards it as the remains of a formerly more developed system. A more sober judgment is that of Métraux (1957, p. 199), who says that the script may very well have been "invented on the spot under the influence of Malay, Indian, or even European writing."

These theories derive entirely from Brown's report. Earlier than Brown, in 1909, the Hamburg Südsee Expedition had visited Woleai and neighboring atolls, but the reports of ethnographic work on these islands were not published until 1935 and later. These publications do not discuss or even refer to the Type 1 writing, but they contain illustrations of objects which bear the same characters. One of the authors, Damm (1938, fig. 279), copied from a wooden board which he found at Faraulep a series of 29 symbols.⁴ This series is reproduced here as column C of figure 25. As will be seen by comparing these Faraulep symbols with those from Woleai in column B, there is virtual identity in graphic form and in sequence, as far as they go. Brown's characters Nos. 24, 25, and 28 do not appear, and his character 31 does not seem very like the one in corresponding position in the Faraulep series, but otherwise they are alike. Apparently the board represents the effort of someone to set down in proper order an already defined set of symbols, perhaps for instructional purposes.

There is also a line of characters copied by Damm from a beam in a men's house at Faraulep (1938, fig. 280). These are not a series, but

³ Brown, 1927, p. 119. This is perhaps not so fantastic an idea as might at first appear, for the Yap "empire," a religio-political hegemony which once may have stretched beyond Truk to the east, still includes in its domain all of the Woleais. But the Yapese themselves, who control the "empire," do not possess any native script.

⁴ This is the only instance of writing in which the symbols run from right to left, as reproduced by Damm. But it is very likely that the board from which the figure was taken was held upside down by the copier. It is impossible to tell from the characters themselves if this was so, since, as will be seen from examination of figures 25 and 26, orientation of the characters is of no significance; but one informant who was shown a copy of Damm's figure inverted the paper in order to read it.

constitute a sentence of actual writing.⁵ Occurring in these lines are 11 of the above 29 characters, 8 more characters which are not among the 29 but appear on Brown's list, including the missing No. 28, and two others which are only on lists furnished us by our present-day informants (fig. 25, col. D). In addition, the Südsee Expedition volumes contain illustrations of a bamboo tinderbox and two canoes from Woleai, a Puluwat nose flute, and a tinderbox labeled "Satowal bzw. Polowat," all of them incised or painted with characters of the same type (fig. 25, cols. E and F).

It is evident, therefore, that the characters found by Brown in 1913 at Woleai were known there and elsewhere in the Central Carolines in 1909; and further, that Brown did not collect the complete set.⁶

In the Japanese literature on Micronesia available to us we have found only one reference to the writing, in spite of the long period of Japanese occupation, 1914 to 1945. This is by Someki (1936, p. 178, fig. 5; 1945, pp. 405, 476-477, and figs. 189, 230) who illustrates 38 characters of the same type (27 of them occurring among Brown's 51, 7 others which appear on lists furnished by our informants, and 4 which only Someki gives). They are not presented in any formal sequence; we have located them in various positions in column G of figure 25 by means of comparison of their graphic forms with characters in the other columns and by means of their attributed phonetic values, which, however, often deviate considerably from the values in the other columns. Someki states that the characters, which he apparently collected at Faraulep in 1934, occur only at Ifaluk, Elato, and Faraulep, and he illustrates a wooden bowl from Elato which bears a few of the characters. He derives some of the symbols, which he identifies as of Roman alphabetical origin, from an early European influence, and, like Imbelloni, speculates that the others are linked to Easter Island writing.

⁵ Two informants have read this line for us, as follows (the numbers are those of the characters in figs. 25 and 26):

39/X/4/III/46/30/28/III/23/25/IV/III/ 11 /53/16/11/I/17
Wolipwe/ masturbate / he /and/ Foimeyat

It will be noted that, as in the samples of writing collected by ourselves, there is no separation of words or phrases and no punctuation. One of our informants, C., occasionally uses a tiny triangle or diamond between words at the level of the uppermost portion of the characters; its use is inconsistent, but it seems to be intended to terminate phrases and sentences.

⁶ There is also to be noted the existence in 1909 of a set of numeral signs at Faraulep (Damm, 1938, pp. 213-216). Damm attributes their invention to a chief Saueru; he states that the symbols originated from tattoo designs and from signs taken from Japanese newspapers, and that their recency of invention was evident from their limitation to use in copra transactions. Since no other authority mentions them, and since no native of whom we inquired during 1954-57 knew anything of them, we will not discuss them further.

TYPE 2 SCRIPT

The Südsee Expedition volumes, while they fail to refer directly to the type of writing we have called Type 1, present a second set of characters of a very different type. From Ifaluk, Damm (1938, fig. 180) gives a list of 18 characters belonging to this second type and shows their phonetic values. Damm and Sarfert (1935, fig. 278) give almost the identical script from Satawal; it contains 19 characters of the same graphic form with nearly the same values as the Ifaluk characters, in slightly different sequence. These two lists are presented by the German anthropologists without comment or analysis, except that Damm attributes the introduction of this writing at Ifaluk to a castaway missionary from Truk. The symbols are reproduced here in columns B and C of figure 26, and are of the type of writing which the present authors will call Type 2. Not only are the symbols and their values different from Type 1 writing; they are clearly derived, as is evident upon simple inspection, from Roman characters, while the symbols of Type 1 in nearly all cases show no resemblance to Roman alphabetical characters.

These are the only two series of Type 2 that we have found in the published materials. But in the lines of writing from the Faraulep men's house, previously mentioned, there are also some symbols of Type 2. And in the three words which Brown appends to his Woleai list there are three characters which mystify him, since they do not occur in his list of 51 Type 1 characters, but which can be identified from the Ifaluk and Satawal series as belonging to Type 2. Besides this, all of the illustrated objects previously mentioned bear characters of this type in addition to the ones of Type 1, and there are additional illustrations of a Lamotrek house and a Puluwat canoe decorated in Type 2 characters only (fig. 26, cols. D-H). And in Someki's list there are 11 characters of this type (fig. 26, col. I).

We have, then, evidence that in 1909 both types of symbols were known at Woleai, Faraulep, Puluwat, and probably Satawal, if not elsewhere, and that at least Type 2 characters were known at Ifaluk and Lamotrek. In 1934, the date of Someki's visit, both systems were known at Ifaluk and Elato.

Explanatory notes for figure 26

Column

- A. Numbers assigned to characters. Numbering after M.'s sequence (col. J).
 B. Damm (1938, fig. 180). Sequence, characters, and attributed values. Ifaluk, 1909.
 C. Damm and Sarfert (1935, fig. 278). Sequence, characters, and attributed values. Satawal, 1909.
 D. Damm (1938, fig. 280). Characters from beams of men's house. Faraulep, 1909.
 E. Damm and Sarfert (1935, fig. 128). Characters from tinderbox. Satawal or Puluwat, 1909.
 F. Damm and Sarfert (1935, figs. 212, 272). Characters from canoe and flute. Puluwat, 1909.
 G. Krämer (1937, pl. 9c). Characters from beams of men's house. Lamotrek, 1909.
 H. Krämer (1937, pl. 15 and fig. 109). Characters from canoes and bamboo box. Woleai, 1909.
 I. Someki (1936, fig. 5, p. 178; 1945, figs. 189, 230). Characters and attributed values. Presumably Faraulep, Ifaluk, and Elato, 1934.
 J. M. of Pigue, Faraulep, 1954. Sequence, characters, and attributed values in Smith's orthography.
 K. } C. of Pigue, Faraulep: 1955A, 1955B, and 1956. Sequence, characters
 L. } and attributed values; attributed values of column L in Smith's orthog-
 M. } raphy.
 N. } R. of Ifaluk: 1955, 1957A, and 1957B. Sequence, characters and attributed
 O. } values; attributed values of columns N and O in Smith's orthography.
 P. }
 Q. A. of Falalap, Woleai, 1957. Sequence, characters, and attributed values.
 R. L. of Pigue, Faraulep, 1957. Characters and attributed values.
 S. N. of Pigue, Faraulep, 1957. Characters and attributed values.
 T. O. of Falalus, Woleai, 1957. Characters and attributed values.
 U. P. of Eauripik, 1957. Sequence and characters.
 V. S. of Ifaluk, 1955. Characters.

REMARKS

1. Positions in sequence of column A assigned to characters in columns D-I, R, S, T, and V by comparison of form of character, and of value if given, with form and value of characters of the other columns.
2. Bracketed characters are those not given in informants' lists but occurring in word samples; or are variant forms from word samples.
3. Values in columns B, C, and I are as given by Damm, Damm and Sarfert, and Someki respectively. Attributed values in columns J, L, N, and O are based on hearing of tape recordings and are in Smith's orthography, except those in parentheses, which were heard under hurried field conditions. Those in column N were obtained from informant R. reading not his own list of characters but the list by informant M. (given in column J). Attributed values in columns K, P, Q, and T, in parentheses, not taped; are given as roughly recorded in the field. Attributed values in columns M, R, and S, in parentheses, not taped; values were written by these informants in Japanese *katakana*, and are here shown in the orthography used by Prof. Y. Ueyehara of the University of Hawaii, who has transcribed the *katakana* characters for us.*
4. Numbers preceding characters in columns B, C, J, P, and U, form separate series, independent of any series of numbers in figure 25. Numbers preceding characters in columns K-O are in the same series as those preceding corresponding lists of characters in figure 25 by the same informants, since these informants gave lists containing characters of both types.

*See footnote following notes to figure 25.

A

	Q	U	U
I	1948	1948	
II	1949	1949	
III	1950	1950	
IV	1951	1951	
V	1952	1952	
VI	1953	1953	
VII	1954	1954	
VIII	1955	1955	
IX	1956	1956	
X	1957	1957	
XI	1958	1958	
XII	1959	1959	
XIII	1960	1960	
XIV	1961	1961	
XV	1962	1962	
XVI	1963	1963	
XVII	1964	1964	
XVIII	1965	1965	
XIX	1966	1966	
XX	1967	1967	

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	
I	1. A ja	1. √ jǎ	√	√	√	A	√, A	A ya	1. √ ya	58. √(yaa)	45. √ ya	56. √(yo)	ya		1. √(yaa)		√(yo)	√(yo)		1. A	A, √	I
II	2. λ jo	2. √ jǎ						λ ü	2. √ yoa			76. √ yoa	63. √(yo-ya)	yoo				√(yō)		2. √	λ, √	II
III	3. E jä	3. E jē	E, E		E, E		E		3. E yoe	49. E(ye)	52. E yae		49. E yae		2. E(yee)		E(e)	E(e)		3. E	E, E, E	III
IV	4. H ī	4. I ī	H	I	H, I		H	H i	4. H i	59. H(i)		82. H(i)	i		3. I(ii)		H(i)	H(i)	H(i)	4. H	H	IV
V	5. O o	5. O o					O		5. O wo	31. O(wa)	33. O wo	83. O(o)	52. O wo	58. O woa	4. O(woa)	47. O(wō)			O(wo)	5. O		V
VI	6. O jo	6. O ö			O		O		6. O yoe	35. O(wa)	56. O woa	84. O(o-wa)	yoo		13. O(yoa)					6. O		VI
VII	7. b fi	8. F fi	F		F, K			F fi	7. F fi	42. F(fi)	49. F fi	73. F(fu-i)	50. F fi		5. F(fii)		F(pi)	F(fi)	F(fi)	8. F	b, t, b	VII
VIII	8. K gi	10. K gi	k	K	K, K		K	K ke	8. K ki	48. K(ki)	53. K ki	58. K(ki)	ki		6. K(kii)		K(ki)				K, K	VIII
IX	9. N nji	11. N ni			N				9. N ngi	34. N(ngi)	27. N ngi	89. N(ngi)	ngi	50. N ngii	[N]			N(ngi)	N(ngi)	10. N	N, N, N, N, N	IX
X	10. N ni	12. N li	N, N		N, N	N	N, N	N ni	10. N ni	46. N(ni)	26. N ni	59. N(ni)	nii	52. N nii	7. N(nii)	[N](ni)	N(ni)		N(ni)	11. N	N, N	X
XI	11. W mi	13. W mi		W, M	M	M	M, W		11. W mi	24. W(mī)	31. W mi	71. W(mi)	mwii		8. M(mii)		W(mī)		W(mi)	12. M	w, m	XI
XII	12. h wi	19. F([F, N]wi)	h	F	F, F, h		h, F		12. h wi	65. F(wī)	28. h wi	72. h(i)	wi		9. F(wii)	[h](wi)		h(wi)	F(wi)		F, F, F, d	XII
XIII	13. B dji	16. B[B]dji	B	B	B			B'chi	13. B chi	45. B(chi)	50. B chi	79. B(chi)	chi		[B]		B(chi)	B(chi)		13. B	B, B	XIII
XIV	14. D bi	14. P pi		P	P, D, q		D, D	D po	14. D pi	63. P(pī)	23. P pi	74. P(pi)	pii	60. D pi	11. D(pii)			D(pyō)		14. P	P, q, d, D	XIV
XV		9. Z si			Z			Z chi	15. Z si		32. Z si	62. Z(shi)	sii	55. Z shii	10. Z(sii)	[Z](si)		Z(ushi)		9. Z	Z, S, ~	XV
XVI	15. E jo	17. E jo			E				16. E yo		43. E yo	81. E(yo)	48. E yo		[E]	43. E(yo)	E(yo)				E, E	XVI
XVII	16. T ti	18. T ti	T				T, T		17. T ti	43. T(tī)	38. T ti	77. T(tei)	ti		12. T(tii)	[T](ti)	T(te)			15. T	T, T	XVII
XVIII	17. R ri	15. R ri	R	R	R, R, R		R	R ri	18. R ri	26. R(rri)		60. R(ri)	ri		[R]			R(ri)		16. R	R, R, B, R	XVIII
XIX	18. U ũ	7. U[A]u						A ũ	19. A u	57. U(ü)	44. U u	87. U(u)	u		[A U]	48. U(uh)	U(u)	U(u)		7. U	U, U, U	XIX

FIGURE 26.—Type 2 symbols and values.
(For explanation, see opposite page.)

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PRESENT-DAY KNOWLEDGE AND DISTRIBUTION OF THE
WRITING

We were able, in 1954 to 1957, to obtain lists of symbols of one or both types from various living informants of Woleai, Faraulep, Lamotrek, Ifaluk, and Eauripik. These symbols are included in figures 25 and 26 under informants' names. In addition we have samples of the writing, though not lists of characters, from several other persons of all these atolls; and additional persons were able to read or at least to identify many of the characters. We also have samples from tattooing and from canoe-house beams (pls. 42-44).

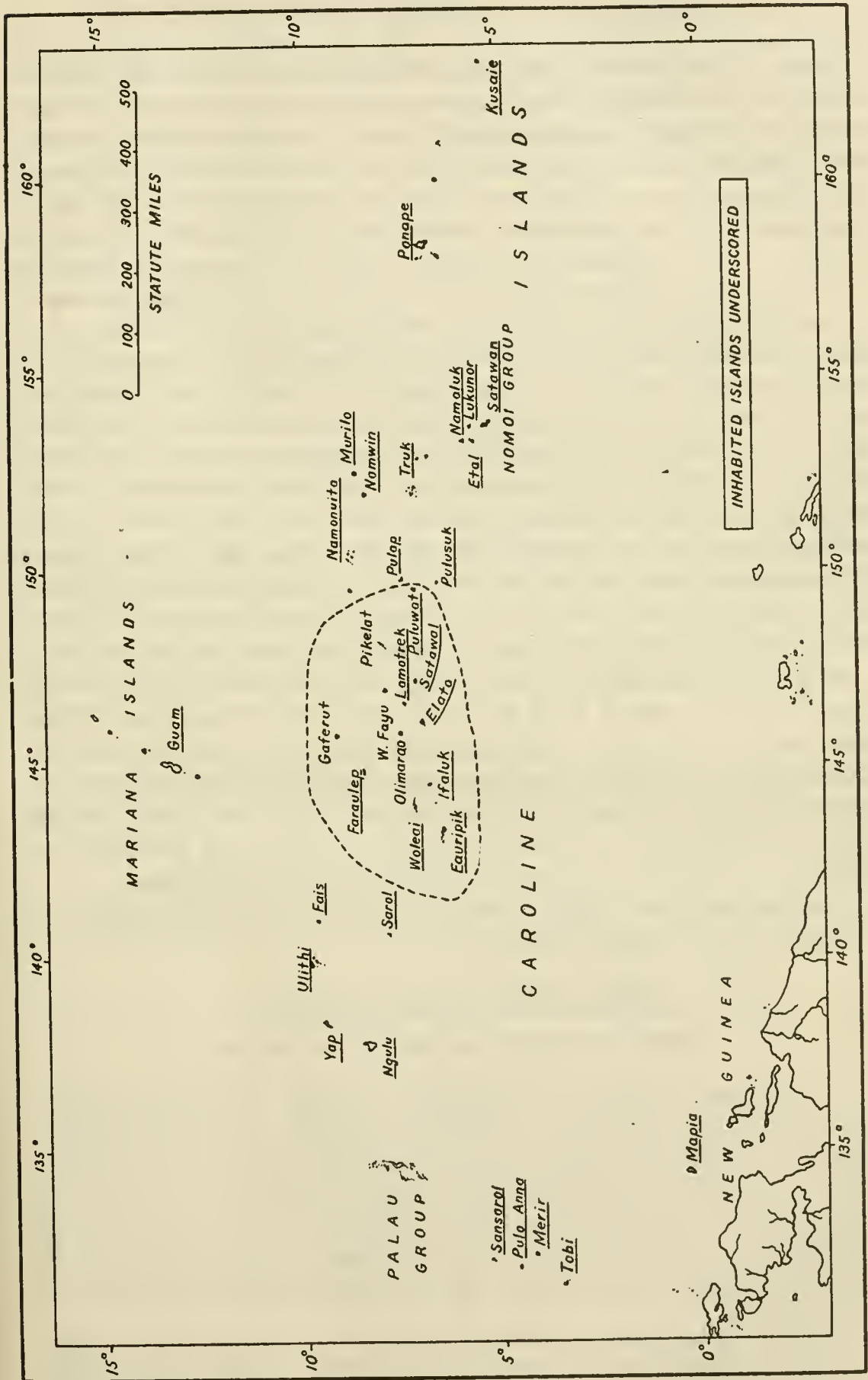
The number of people who today know the writing is not certain. At Faraulep two men and two women provided us with lists which included both types of characters (fig. 25, cols. H-M, and fig. 26, cols. J-M, R, S), and the two men wrote sample words and texts; another two men and two women (two of them of Woleai origin) were able to recognize from 14 to 38 Type 1 characters and 15 to 17 of those of Type 2; still another woman is said to know the writing; in this list of Faraulepese familiar with the system we should also reckon a tenth person, a man who died in 1955, but who the previous year had recognized 17 symbols of Type 2 and is said to have known the other type. As for the other atolls in the Woleais:

Woleai atoll: Two women of Falalap Island gave us Type 1 lists and wrote Type 2 characters in sample words (fig. 25, cols. R, S; fig. 26, col. Q); a Falalus man wrote a Type 2 list (fig. 26, col. T); a Wottagai woman and a Siliap man wrote some Type 2 characters and words; two Wottagai men could read symbols of Type 2; and we copied examples of writing in tattoo and on house beams and tinder-boxes at Falalus and Wottagai (as we did also at Faraulep). *Eauripik:* One man wrote a Type 2 list (fig. 26, col. U), and another man recognized 16 of the Type 2 characters and wrote sample words; a third man, the last at this atoll who knew Type 1 writing, died recently. *Ifaluk:* One man wrote three lists containing both types (fig. 25, cols. N, O; fig. 26, cols. N-P) and a long text in characters of both types, as well as sample words; another man wrote a similar text (his characters are shown in fig. 25, col. T, and fig. 26, col. V); and a third man, who claimed to have once known the whole system, could read a large number of the characters. *Lamotrek:* A man of Ifaluk origin who learned the writing at Ifaluk by means of letters from Faraulep, gave us two Type 1 lists (fig. 25, cols. P, Q) and was able to read additional characters of both types; he also wrote sample words; a second man recited the lists orally; and a third could read many of the characters; and again there was writing on house beams. *Elato:* No one knew the system, although several persons bore

tattooing in Type 2 characters done by a woman now dead, and we copied characters from house beams. *Satawal*: One man who died in 1955 had the previous year recognized some Type 2 characters; no one else literate in the writing could be found, although a Satawal woman who did tattooing in both types is still living at Palau, and at least four women (one of them from Woleai) were tattooed with the symbols; and writing on house beams, most of it dating from Japanese times, was once more recorded. As for Puluwat, east of the Woleais, though three informants knew the writing for what it was, they could read none of it and stated that the few people who had known it were dead. Altogether we have samples of writing and/or lists of characters from 27 living or recently deceased persons, as well as characters copied from tattooing and from beams and other objects. No doubt some of the people whom we tested only for reading ability can also write in the script.

It would appear, then, that the writing has or once had a geographical distribution from Eauripik in the west to Puluwat, 300 miles to the east, and was known on all the inhabited islands between. (See map 1.) Specific inquiry elsewhere in the Carolines established that it had not existed beyond these limits,⁷ but it was often recognized for what it was; people on Pulusuk, for example, have heard of it as "writing of Faraulep." Within the area where it exists, not many persons seem ever to have known it, and knowledge of it is declining. While formerly there was some interest among younger people in learning the writing, many today use an adaptation of Japanese *katakana* writing instead, and the children are being taught to write in the English alphabet in Government schools. All of our informants were past their youth. Previously, when more people knew the system, it was used for writing letters to one another, often to request supplies of native and European commodities, but nowadays, with travel made easier and with stores available, this function of writing has lapsed. The few people who know the script today use it primarily to record chants and magical and medicinal formulae. One man says he learned the writing specifically in order to be able to record songs, medicines, and magic, which he keeps in a notebook. A recent convert to Catholicism keeps a notebook of catechism lessons in the writing. An Ifaluk man who, in late Japanese times, became lost at sea, states that during his misadventure he kept an account in the native writing which included the birds he saw "and their meaning." Lt. Kevin Carroll (tragically killed in Iran in 1957), who was an administrator in the military government at Yap in 1946, told us that he sometimes transmitted orders to the Central Carolines, through an Ifaluk amanuensis, in the native script.

⁷ We have no information for Pulap, just east of the Woleais.



MAP 1.—Area of the occurrence of the script.

NUMBER AND SEQUENCE OF CHARACTERS

From all the sources previously mentioned and from the lists of characters and samples of writing we ourselves have collected, we have a total of at least 78 characters of Type 1, to most of which we can assign phonetic values, and 19 of Type 2. We also know that there is a definite sequence. For Type 1, M.⁸ of Faraulep gives a list of 42 characters identical in sequence with the first 42 of Brown's list from Woleai. Of the three lists obtained from C., one is identical in sequence as far as Brown's No. 21, one as far as No. 22, and the third to No. 50 (except for character 35, which is given as the 80th in C.'s list). Similarly, of R.'s two lists containing Type 1 characters, one coincides with Brown's as far as character 43 (with some omissions), and the other up to character 20 (with one omission) and again from 29 to 43. From T., one list (with two omissions) runs in the same order up to No. 18, and another list (with some omissions) to 47. B. gives a list which duplicates Brown's from 1 to 12, omits 13 to 38, but resumes at 39 and runs to Brown's 49. And the list by A. runs in Brown's sequence to No. 44 (with four omissions and with No. 28 out of order). The list from the Faraulep wooden board of 1909, with three omissions, also runs in the same sequence up to No. 32.

As for Type 2, only five lists are given in sequence separate from Type 1 (fig. 26, cols. B, C, J, P, U). It will be seen that four of them agree as far as No. VI. The Ifaluk list of 1909 and the Faraulep list of 1955 agree completely in sequence except for the omission of one character in the former. The Satawal list of 1909 and the Eauripik list of 1957 likewise are in agreement (not considering omissions) as far as No. XI, and both have No. XIX in seventh position.

It is evident, then, that we have here a system of writing which was well-defined some time before 1909.

ORIGIN OF THE WRITING

DISTINCTNESS OF THE TWO TYPES

What is the origin of the Carolinian writing? We may disregard the speculations of Brown, Diringer, Imbelloni, and Someki, since there is no evidence to support them and they border on the fantastic. In answering this question, it is important to note that of the five lists of characters we have obtained from published sources, two (Brown's Woleai list and the list from the wooden board found at Faraulep by Damm) contain only one type, the non-alphabetical type which we

⁸ Designations of informants referred to in this paper are as follows: A.: Marutang of Falalap, Woleai. B.: Nachomai of Falalap, Woleai. C.: Chiyemal of Pigue, Faraulep. L.: Laichib of Pigue, Faraulep. M.: Magilo of Pigue, Faraulep. N.: Nesawen of Pigue, Faraulep. O.: Maluchorang of Falalus, Woleai. P.: Fagollifek of Eauripik. R.: Maroligar of Ifaluk. S.: Tarof of Ifaluk. T.: Tachep of Lamotrek.

have called Type 1; two (the Ifaluk and Satawal lists published by Damm and by Damm and Sarfert) contain symbols which are all of Type 2; only one (Someki's), which appears to be in no formal sequence, has both types. In other words, the natives from whom the lists were obtained themselves consider the symbols to be of two types; we have not sorted them out on any logical grounds. Also, some of our informants gave us the two types in two separate sets. Other informants gave us mixed lists, but nevertheless distinguish the characters as belonging to two types of writing.

SIMILARITY OF TYPE 2 SCRIPT TO THE ALPHABET

When we first examined the symbols it was immediately apparent that those of Type 2 were taken without great alteration from Roman alphabetical symbols; they all appear to be modified forms of our own upper-case letters; whereas most of those of Type 1 bore little resemblance to the alphabet or, it seems evident from examination of the exhaustive compilation of other forms of writing illustrated by Diringer, to any other known system of writing. It therefore suggested itself to us that Type 2 was first introduced into these islands from some European source, and that, perhaps because it fitted poorly into the native phonetic patterns, another system, Type 1, was then devised in order to fill a need for more adequate representation.

SYLLABIC VALUES

It was apparent also that neither type of symbol was used alphabetically, except for symbols representing vowel sounds alone. The three words that Brown gives us indicate that both types were being used in 1913 to represent syllables, not single phones. The words and phrases we later obtained from our own informants verified our guess that this was in fact a syllabary, and suggested what the process of development had been. All the symbols, of both types, have names which are also their attributed phonetic values (although, as we shall see, in actual writing values are often only approximate). Except for characters representing vowels alone, nearly all of which belong to Type 2, they represent open syllables composed of an initial consonant or semivowel followed by a vowel. Further, every symbol of Type 2, excluding those representing vowels alone, has an attributed value whose vowel portion is a long *i*, while all symbols of Type 1, with two exceptions (Nos. 7 and 67) have as their vowel portions attributed values other than *i*. Writing is accomplished by a mixed alphabet-syllabary system; when a syllable consists of a vowel alone, the character for that vowel is used, as in alphabetical writing; when it is formed by a consonant-plus-vowel or semivowel-plus-vowel combination, the appropriate syllabic character, of either type, is used. (See table 2.)

TYPE 2 HISTORY RECONSTRUCTED

This evidence caused us to guess that a European alphabet or a modified form thereof had been introduced to these islands, but with names attached to the letters different from those we know them by; that the names for the consonantal letters consisted of the phonetic value of the consonant followed by an *i* suffix; that the natives did not understand the acrophonic principle upon which the names were based, hence did not attempt to write alphabetically but took these names as having syllabic value and tried to write their language with them;⁹ and that they devised the other system of writing, Type 1, when they found the first system of syllabic representation, Type 2, inadequate to reproduce all the sounds of their language. This reconstruction of history seemed consistent with the consistently open form of the syllable in this language, syllable-final consonants commonly occurring only at the ends of words. Binary geminate sequences occur, but dissimilar consonants are almost always separated by at least an excrescent vowel. Among the 301 Woleai words that we have assembled from the text material in Smith (1951), written in his orthography, only three combinations seem to be exceptions, those italicized in the place names *So/w/g*, *Ya/u/rw/pii/g*, and *Ya/nga/lh/ge/ra/i/lh*. Thus, since the spoken language in large part is composed of open monosyllables, such a system of writing serves it well. When a spoken word has a terminal consonant, only the consonantal portion of the final character used in writing the word retains phonetic value, and the vowel portion which follows it becomes valueless.

POSSIBLE SOURCES

Where could the natives of these islands have obtained the Roman characters? Dates of discovery by Europeans range from 1686 for Faraulep to 1828 for Eauripik, but the natives were in intimate contact with other islands which had earlier contact with the West; Yap, for example, was discovered in 1526, and Fais in 1543. In the late 18th and early 19th centuries, visits by explorers and traders became fairly frequent, and a number of ship's deserters and castaways have left accounts of their stay in various of the Carolines. But missionaries failed to establish permanent stations in these islands until the end of the 19th century, and the natives remained in virtually aboriginal condition. The natives themselves were probably more active agents in culture dispersal in those days than were explorers, traders, or missionaries. They are skilled mariners and navigators, and possess a remarkable geographical knowledge. Much has been written of the navigational skill and exploratory zeal of the Polynesians.

⁹ For examples of writing in 1909 with exclusively Type 2 characters, see Damm and Sarfert (1935, p. 277).

sians, but the similar qualities of the Micronesians have remained in obscurity. According to Hornell (1936, p. 438), "In all the Micronesian groups of islands the design of the outrigger canoe reached a higher level of development than in any part of Polynesia, as did also the knowledge of the science of navigation possessed by certain of the islanders." Meinicke (1876, p. 374) likewise refers to the natives of the Carolines and Marshalls as the foremost mariners of the Pacific, far surpassing the Polynesians in this respect, and Krämer compares Micronesian and Polynesian geographical knowledge with similar advantage to the former. In earlier days a flotilla of canoes from the Central Carolines assembled each April at Gaferut¹⁰ and made the 300-mile trip thence to Guam in the Marianas in 8 days; canoes from Woleai, Faraulep, Lamotrek, Elato, Satawal, Puluwat, and possibly Pulusuk and Namonuito participated in this expedition; they traded shells, mats, cordage, and canoes for iron knives, beads, and cloth, and made the return voyage in May or June. Guam, be it noted, had been missionized by the Spanish beginning in 1668. This commerce, apparently interrupted by the Spanish conquest of the Marianas, was resumed in 1788 and persisted until 1873. Kittlitz (1858) encountered Caroline natives in 1827, e. g., at Faraulep, who already spoke fluent Spanish, an ability no doubt acquired on visits to Guam. Objects of Marianas origin were traded farther east than the islands directly involved in the commerce, e. g., to Truk and Namoluk (Finsch, 1900, p. 48; Girschner, 1912-13, p. 180), which got their iron tools and tobacco from Puluwat. Lütke (1835, p. 295) found cats on Luku-nor (in the Nomoi group), known by the Spanish name "gato," which, no doubt, were obtained from the Marianas via such native traders.

A permanent colony of Carolinians grew up in the Marianas after 1815, with settlements at Guam and Saipan, and later at Tinian. These colonists, who numbered many hundreds, came, and continued until recent years to come, from the very islands we are here concerned with, as well as from others which lack the writing; visits back and forth to their home islands were frequent; much trading involving European manufactures occurred.

There was also contact with the Spanish in the Philippines. The Spaniards at Guam employed Caroline crews to take them as far as the Philippines. The journal of the Salem ship *Clay*, Capt. W. R. Driver, reports finding in the Fijis in 1827 two natives of the Carolines left there by a Manila brig 5 years before; these men signed on the *Clay* as crew members and returned to Manila. Traditions of seafarers cast away in the Philippines and successfully returned home are known as far east as Puluwat. The first knowledge of the Woleais comes from Spanish accounts of 30 canoeloads of people from these

¹⁰ Not West Fayu, as is often stated in the older literature on the subject.

islands driven ashore at Mindanao and elsewhere in 1664, and the literature contains many more such reports in later years, including the most recent case in 1954. Many of these castaways made their way home, either by themselves or aboard foreign vessels.

Another point of contact with the outside world was by way of Yap, whose dominion over all the Central Carolines has been described by several writers,¹¹ and continues in diminished degree until today; formerly it extended farther east than the islands we are concerned with here, and contacts with Europeans would have been possible at both ends of the area involved. Mission activities at Yap, to be sure, did not commence until 1886, but traders were active there earlier in the century.

Finally, maps drawn by natives of these islands and sailing directions which they are capable of giving reveal knowledge of places in the Philippines, parts of Indonesia, the northern fringe of Melanesia, and some of the islands of the Gilberts and Polynesia.

Nevertheless, none of the foregoing gives us any clear indication that some early contact with the West or with literate natives from other regions resulted in familiarity with writing among Central Carolinians. We have only one report of writing from this area before the German expedition's visit in 1909: Arago (1822, p. 35) reproduces a letter from a Satawal chief written in response to the order of a trader at Rota in the Marianas; the writing used in this letter is purely pictographic, the chief having made drawings of the objects he desired in return for the shells which he had for barter, and there is not the slightest resemblance to the system of writing we are here concerned with. Nor is this system reported by Chamisso, Choris, Dumont d'Urville, Freycinet, Kittlitz, Kotzebue, Lesson, or Lütke, all astute observers, in the early 19th century, and it is not likely that it would have escaped the attention of Christian, Finsch, or Kubary in the latter part of that century if it had existed then.

It seemed to us therefore that the writing must be of more recent origin. Also it appeared that the most likely place to look for its source was in the islands to the east of the area concerned. To the west and north are Palau and the Marianas, whose inhabitants speak Indonesian languages, and Yap, whose language, although it is usually classified as Micronesian, is very different from the languages of the Central Carolines. The borrowing of Roman characters from these islands, even though some of the natives of the Woleais speak Yapese, would for these reasons have been difficult. But more important, alphabetical writing was introduced to the Marianas, Palau, and Yap by the Spanish, and the letters of the alphabet, as

¹¹ See Lessa, 1950.

given orally by the natives of those islands today, all have modified Spanish names, very different from the names in the Central Carolines of the Type 2 characters which we have considered to be of alphabetical derivation.

LINGUISTIC AFFILIATIONS

The language of the Central Carolines belongs to a larger linguistic group which has a geographical range stretching from Ulithi in the west nearly to Truk and Nomoi (or the Mortlocks) in the east, and includes also the islands south of Palau. This area has four subdivisions: in the west, Ulithi, Fais, and Sorol; to the southwest, Sonsorol, Pulo Anna, Merir, Tobi, and probably Mapia; to the east, Pulap, Pulusuk, and Puluwat; and in the center, all the inhabited islands of the group commonly referred to as the Woleais: Faraulep, Eauripik, Lamotrek, Elato, Ifaluk, Satawal, as well as Woleai atoll itself. The Woleais, together with Puluwat, constitute the area where the writing is known. The languages of these four subdivisions are mutually intelligible, differing only in some phonemic shifts and in some minor vocabulary changes. Farther east, the inhabitants of Truk and of the islands to the north and south of Truk, including the Nomoi group, speak dialects of another language, whose relationship to the first language group is close but not sufficiently so to permit mutual intelligibility. However the two vocabularies offer a great number of cognates and the phonemic patterns are not remarkably different (Smith, 1951).

THE ALPHABET OF TRUK

In the first language area there has not been, until the time of the American administration, beginning after World War II, any literature in the native tongue. But in the second area there has been, since 1878, a series of Bibles, hymn books, catechisms, arithmetic instruction books, and so on. These are all in the Nomoi dialect, and were all written by the missionary Logan, who was assigned this task by the American Board of Commissioners for Foreign Missions.¹² The books are used not only in the Nomoi group but in

¹² Available to us are the following, all by the missionary Logan:

Maku en Mark. 1880 and 1882 editions. Honolulu.

Kapas fel, puk eu, kapas en lom kana, Mortlok. 1880. Honolulu.

Nor an lamalam kana; kapas an Mortlok (Mortlock Island Hymns). 1881. Cincinnati.

Puk an afalafal, kapas an Mortlok. 1881. Honolulu.

Testament Sefa an amam Samol o Ran amanau Jisos Kraist. 1883 (1st edition) and 1944 (7th edition). New York.

Kapas fel, puk eu: kapas en Kot, Mortlok. 1884. New York.

Aritmatik. 1887. Honolulu.

Puk an ais fel, me ais an lamalam kana (Mortlock catechism). 1888. Honolulu.

Puk an kël, me kël an lamalam kana, lan kapas an Ruk me Mortlok. 1888 (2d ed.), Honolulu; and n. d. (3d ed.), San Francisco.

all of the Truk area without accommodation to dialect difference. They are printed in ordinary roman characters, some of them also using a number of diacritical devices.¹³

Trukese today, who write alphabetically and who still use the Logan Bible unaltered from its 19th century form, when asked to recite their alphabet nearly all respond with the following sequence: A E I O U F S K L M N N P R R T.¹⁴ These are the very same characters that are used in three of Logan's books, except that Logan also uses a J. (J is used on Truk by the older generation, almost solely for writing biblical names.) Also one of the Logan books (*Puk an afalafal*, 1881, p. 1) contains, apparently for instructional purposes, almost the same sequence: A E I O U F J K L M N N P R R S T. In oral recitation, the vowels have approximately Spanish values, and the consonants which follow are given as though suffixed by *i*, thus: fi, si, ki, li, mi, ni, ngi, pi, ri, chi, ti. That is, the names of the Trukese consonants are the same as the names and phonetic values of the Type 2 syllabic characters of the Woleais.¹⁵ There are only five vowels as against the eight in the Type 2 lists, and the sequence of characters is slightly different—we will shortly attempt to explain these differences—but the relationship would seem to be obvious. The Truk area would seem, then, to be the source of the Type 2 writing of the Central Carolines. Moreover, inasmuch as Logan began his work in 1878, Type 2 writing must have come into use since that date.

ALFRED SNELLING AND THE TRUKESSE CASTAWAYS

How did the Trukese alphabet get to the Woleais? No American Board missionary was ever stationed there, but the Ifaluk informants of Damm told him that a missionary from Truk, who was en route from Ulul (in Namonuito atoll) to Truk in a sailing canoe, together with a number of Trukese, was driven ashore at Eauripik at some unspecified time; there he remained until a Woleai chief arrived and invited him to accompany him back to Woleai; the Trukese already knew how to

¹³ Logan's books all contain the following roman characters; A, E, I, O, U, F, J, K, L, M, N, P, R, S, T. Three have in addition *N* and *R*. Three others have *N*, *R*, *A*, and *O*. The 1888 catechism has all of these characters, plus an umlaut *E*. The second edition of the hymn book published in 1888 has all of these characters again, as well as diacritical devices—accent, two forms of circumflex, and umlaut—for A, E, I, and O, which also have italicized forms. The 3d edition of the same hymn book (n. d., but published before 1899) converts all of these forms to italicization. After 1900 the only nonstandard orthographic devices are italicized *N*, *R*, *A*, and *O*.

¹⁴ The Spanish, before 1900, introduced their own alphabet, which has never caught on, one reason being that two of the consonants, as pronounced by the Spanish, form words with vulgar meaning.

¹⁵ The alphabets of Ponape and Kusaie, in the Eastern Carolines, and of the Marshall Islands are similar; that is, they are given with the vowels, pronounced with Spanish values, first, then the consonants which again all have names with *i* endings. Apparently this regularization of consonantal names was the standard pedagogical device of the American Board of Commissioners for Foreign Missions missionaries. These islands, however, have languages with phonemic systems different from those with which we are concerned in this paper, a fact reflected in the local alphabets; thus the missionaries did not introduce F at Ponape, where there is no corresponding phoneme, but did introduce both D and T. These alphabets, therefore, could not be the source of the Type 2 writing.

write and taught the art to their hosts at Eauripik and Woleai; the account goes on to say that the Trukese went back to Truk via Ifaluk and Lamotrek and taught writing to the inhabitants of these atolls too. To this account is to be added that of Burrows and Spiro (1953, p. 201), who say that writing "came to Ifaluk from Woleai, where it was taught by a missionary." (Burrows gives no further information about the writing.)

One of our informants, a man of Eauripik, confirmed the foregoing in the following words: "An American Protestant missionary from Truk got lost on a boat during German times (1900-1914). He stayed there (Eauripik) and taught the people (how to write) His name was Misinining. He was there only for three or four months and left for Falalap (in Woleai) where he soon died." Another Eauripik man refers to this missionary as Misililing and remembers that he and the Trukese all gave instruction in writing.

All of these accounts, of course, must refer to the writing we have called Type 2, since the castaway party from Truk must have used for instruction the alphabet known to them, and we have seen that the alphabet is the inspiration of Type 2 writing.

The mention of a missionary called "Misinining" sent us to the records of the American Board of Commissioners for Foreign Missions, where we found that a Rev. Alfred Snelling was missionary to Truk beginning in 1888, and that he was lost at sea in a native boat in 1905 (Bliss, 1906, pp. 129, 162; American Board of Commissioners for Foreign Missions, Annual Reports, 1886 to 1906). The equation of Mr. Snelling and "Misinining" is obvious. Damm (1938, p. 133) and Krämer (1937, p. 203), in context unrelated to anything bearing on the script, also refer to Snelling. Damm relates only that Snelling sailed in a native canoe for 93 days until he reached Eauripik, whence he went to Woleai. Krämer gives the story in greater detail, telling how Snelling, en route from Puluwat and Ulul to Truk, went astray and drifted for 3 months until he reached Eauripik, whence a boat crew from Woleai fetched him to their island, where he died.

None of these published accounts which mention Snelling say anything about his role in the introduction of writing. However, Mr. Frank Mahony, presently District Anthropologist at Truk, has established the connection in the following interview with a Trukese named Airas. The story of Snelling is well known at Truk, but Airas, who was a student at Snelling's school in 1900, and who made the ill-fated voyage with him, is apparently the last survivor of that journey. Mahony relates:

Snelling left Tötiw [Tarik] Island [in Truk atoll] intending to go to Ulul and Piserach [both in Namonuito atoll]. He picked up the chiefs of Puluwat and Ulul on Etten [in Truk atoll], then went to Tol [in Truk atoll] to get Sirom and Kinion

[two men]. Snelling took 400 baskets of preserved breadfruit with him to give to . . . Piserach and Ulul. They left Truk and went to Piserach, thence to Ulul, then back to Piserach. They left Piserach around 2:00 PM to make the return journey to Truk. . . . Ten hours later . . . they were still not out of sight of Piserach. . . . At 3:00 AM a light breeze blew up . . . While Snelling slept some passengers they had picked up on Ulul . . . talked the crew into changing course. . . . From then on they searched in vain for Truk. They had a little copra and some drinking coconuts aboard. . . . At the end of seventeen days this was all gone. They managed to catch a few fish. They were at sea about ninety days until finally they got to Eauripik. Meanwhile . . . four of them had . . . died of starvation. The people of Eauripik took very good care of them. . . . When a big chief of Woleai named Okupeniar [Krämer gives his name as Agupelior] came they went with him to Woleai . . . [The three Japanese living there] took Snelling into their house. . . . Snelling knew he was going to die and asked to be moved . . . to the men's house . . . and in twenty-four hours he was dead. . . . After a few months Airas and the others left Woleai and went to Lamotrek. . . . Then they went on to Satawal and on to Puluwat . . . then after a couple of weeks . . . back to Truk.

Mahony:

Did you hold school on the islands?

Airas:

No, we ¹⁶ just taught them to write. . . . They didn't know how before. . . . We taught (the Trukese alphabet) to the people of Eauripik and Woleai . . . but not to the people of Satawal, Puluwat, and Lamotrek. . . . We didn't stay long enough on these islands, and besides they already knew how to write. On Lamotrek the Guamanian wife of the white trader had taught the people how to write. . . . The people of Satawal probably learned from Lamotrek.

ADOPTION OF THE TRUKESE CHARACTERS

Airas recalls the following alphabet as used by himself and the other Trukese instructors: A E I O Ō U F S K L M N Ñ P R Ŕ J T. It differs from the modern Trukese alphabet only in having two extra letters, Ō and J. Of these letters, all six vowels occur in the Type 2 writing of today, where the vowels A, E, I, and O are to be found in positions I, III, IV, and V, and where U occurs in different positions on different islands (see fig. 26). The fifth character in Airas' series, Ō, is no doubt the sixth in the various versions of Type 2 writing and is to be equated with the italic O of some of the Nomoi books of Logan. As for the other two vowels in Type 2 writing, one of them, the second in all the series, is very likely the italic A of most of the Nomoi books, and the E-like character, No. XVI, is possibly derived from the italic E which we have found in three of those books (though we later suggest a possible Japanese *katakana* derivation.) Airas' failure to include these two letters in his series may very well be due

¹⁶ For the record, we should mention the names of the other Trukese teachers, who, with Airas, carried on their instruction, using pencil and paper as well as writing in the sand. They are Kinion, Strom, Unetor, and Resapechik.

to a fault of memory; 50 years have passed since his adventure, during which time the Trukese alphabet has become standardized in the version given on page 288, so that Airas may be influenced by modern writing, which tends to omit italics.

All the consonantal names in the alphabet given by Airas are pronounced by him with *i* endings. Identification of most of them with the Type 2 characters is readily apparent upon inspection and need not be discussed. A few Type 2 characters have been altered in orientation (as Nos. IV and XI) or in minor detail (as Nos. VIII, X, XIII, and XIV).¹⁷ Only the Type 2 symbol representing the sound *wi* (No. XII) is at all puzzling. Possibly it is the letter J, which occurs in all the Nomoi printed books, where it is used interchangeably with S; it occurs also in Airas' alphabet, where, like S, it has the name *si*. J is disappearing in modern Trukese writing because of this equivalence with S, but its former position is shown by its replacement by S between F and K. Now if J was indeed among the letters taught to the people of Eauripik and Woleai, as Airas states, its obvious superfluity may have resulted in its being used in Type 2 writing to represent a sound for which no symbol was available but which was felt to be required, namely *wi*; the position of character XII at the very end of the Satawal list (see fig. 26), as though it was tacked on after this transformation was effected, suggests this explanation.¹⁸

The only letter in both the Trukese alphabet and in Airas' list which does not appear in Type 2 writing is L. In the Nomois, where Logan worked out the alphabet used in all the printed materials of the Truk area, *l* and *n* are both phonemes, as they are also, apparently, in all of the low islands around Truk. But at Truk itself there is no *l* phoneme, only *n*, and L is used in writing when necessity is felt to defer to traditional spellings based on the Nomoi Bible, the Bible used at Truk. Now at Woleai atoll there are four corresponding phonemes, which Smith (1951) writes *l*, *lh*, *n*, and *nh* (the *h* indicating a release). These phonemic distinctions are probably made also in the speech of most of the other Woleais. Yet in the writing no necessity is apparently felt to make the same distinctions; we shall see that this holds true for the characters of Type 1 also, that is, those characters whose syllabic

¹⁷ Thanks to Mr. Mahony, an old man of Murilo (an atoll north of Truk) has furnished us with examples of the alphabetical characters used in the Truk area about 50 years ago, apparently as the missionaries taught them. There are some differences in form of the characters when they are compared with the Type 2 writing of today in the Woleais, but at least his E, N, and T bear the same peculiar embellishments as the corresponding Woleal characters (see fig. 26), so it would appear that the alteration from the graphic form of Roman upper-case characters did not occur in the Woleais but in the Truk area.

¹⁸ Airas would seem to have transposed J and S in position in his series. However, a Nomoi man who went to Snelling's school at Truk from 1897 to 1901 gives the final letter of the alphabet as he learned it as J, so possibly Snelling's party introduced it to the Woleais in this position. Modern samples of tattooing collected by Mr. Mahony at Puluwat contain a J-like character which is read as *wi*, not *si*.

values contain these four consonants, suffixed with vowel sounds other than *i*. If L was among the letters taught by Airas and his companions, it had dropped out of use as a Type 2 character between 1905, the date of Snelling's drift voyage, and 1909, when the Südsee Expedition collected Type 2 lists at Satawal and Ifaluk. However, in the various Type 1 series there is an L-like character at position 33, whose value Brown gives as *la* and the consensus of our informants makes to be *ne* or *nae*. We may guess that the Trukese castaways introduced L and N as equivalent in name, because of the Trukese phonemic pattern, and that L was therefore converted into a Type 1 symbol whose value was rather similar; one of our informants, C., actually states that character 33 was indeed so derived.

Airas' account is that the Trukese castaways taught the alphabet as they knew it only to the natives of Eauripik and Woleai; that the Guamanian woman at Lamotrek had already taught the people of that island to write; that Satawal probably got its writing from Lamotrek; and that by then the people of Puluwat also knew how to write. However, it is hardly possible that the Satawal writing of Type 2, recorded in 1909, would have had the consonant-plus-*i* value pattern, as it did, if it were of Guamanian origin. Guam uses a standard Roman alphabet, whose letters have Spanish names, while the Satawal characters of Type 2 are in form, name, and value completely in the Woleai pattern. Moreover, the form, name, and value of the Lamotrek characters obtained in 1955, as well as the form of the Lamotrek and Puluwat characters of 1909 painted and incised on the various objects, previously mentioned, are all of the same pattern. As for the Guamanian woman, a Lamotrek informant who in 1905 would have been about 18 years old denies that she taught anyone to write. Either Airas' memory is at fault or whatever Guamanian influences may have been present in 1905 had disappeared by 1909. If missionaries had previously visited Puluwat, as Snelling did the islands north of Truk in the course of his missionary work, or if natives of Puluwat attended the missionary school at Truk, it is possible that there may have been a separate introduction of the alphabet there; there do seem to have been native missionaries from Truk at Puluwat from time to time. This might explain Airas' statement that the people of Puluwat already knew how to write. Examples of relatively recent tattooing collected by Mr. Mahony from islands all around Truk, including Puluwat, are done in upper-case alphabetical characters, many of which show the peculiarities of the Type 2 characters we have recorded from the Woleais (e. g., the triangular embellishments on the cross strokes of the E, T, and other letters); these may stem from a separate influence from Truk.

In this connection, it will be noted (see fig. 26) that the two Type 2 lists of 1909 are in rather different sequence. The Ifaluk list (col. B) of 1909, however, is identical to the Faraulep list (col. J) of 1954, except for omission of No. XV, and R.'s partial list (col. P) of 1957 agrees in having No. VI out of order and Nos. XIV and XV reversed. On the other hand, the Satawal list (col. C) of 1909 is in fairly close agreement with the Eauripik list (col. U) of 1957, as well as with the present-day Trukese alphabet and with the alphabet Airas says he taught at Eauripik and Woleai in 1905; all of them have U (No. XIX) following italic O (No. VI), then F (VIII), S (XV), and, except for one of these lists, K (VIII); and P (XIV) is followed by R (XVIII) and italic R (XIII) except on the Eauripik list. This would possibly suggest that there were two separate introductions of the alphabet, each in a different sequence; but then it must be assumed that in each case the same development followed, that is, the names of the letters were both times taken as their phonetic values and the letters converted into a syllabary. More likely the alphabet introduced in 1905 at Eauripik and Woleai was similar in sequence to Airas' list as he gave it 50 years later, and as it diffused among the Central Carolinians a second tradition developed which became fixed by 1909, as seen by the persistence of the Ifaluk sequence of 1909 until 1954 at Faraulep.

It is also of interest at this point to note a similar development in Type 1 writing. Characters 24, 25, and 28, occurring in identical positions in the lists of Brown (Woleai) and of M. and C. (both of Pigue, Faraulep), are either missing entirely or are out of sequence in both of the lists of R. (Ifaluk) and in those of T. (Lamotrek) and A. (Woleai), as well as on the Faraulep wooden board found by Damm in 1909. Also, T.'s list and R.'s lists place No. 52 directly after No. 47. It would therefore seem that at least two slightly different sequences in Type 1 writing already existed in 1913 (the date of Brown's visit), and that this difference has persisted until today. This is probably what R. has in mind when he states that there are two different systems, one which developed at Faraulep Island, the other at Pigue Island (both in Faraulep atoll), and that further changes have occurred in the course of teaching the writing to other people. Though we have no specific information as to inventors of new characters, it seems obvious that there have been many since the first invention was made; the variability in the different lists after the first 50 characters (see fig. 25) attests to such development.

SPREAD OF TYPE 2 WRITING

We do not have a great deal of information about the spread of Type 2 writing after the introduction of the alphabet by Snelling and his party, and what we have is sometimes conflicting. According to

Damm the Trukese castaways taught writing to the people of Eauripik, Woleai, Ifaluk, and Lamotrek. A Eauripik man, Maninifek, states that Snelling himself gave the instruction to the people of Eauripik. P. of Eauripik, who attended some of the lessons, recalls that both Snelling and the Trukese were the teachers. Informants at Woleai, Ifaluk, Lamotrek, and Satawal state that the castaway party stopped for brief periods of time at those islands on their return journey to Truk, but gave instruction only at Woleai. Lamotrek informants also say that they learned from one Reghipol, who returned to Lamotrek from Woleai about 2 months after a typhoon which we date as having occurred in March, 1907; he had learned to write at Woleai, undoubtedly in Type 2. But two women of Woleai, A. and B., say Type 2 writing came to Woleai from Lamotrek; this can hardly be correct, since we know that the alphabet, from which Type 2 writing sprang, was taught at Woleai by Snelling. C. and Tereso of Pigue, Faraulep, say that their atoll got its Type 2 writing from Lamotrek also. And Burrows (1953) reports that the Ifaluk (Type 2?) writing came from Woleai. These are the only statements we have as to the dispersal of the Type 2 script from its presumable Eauripik-Woleai center.

TYPE 1 HISTORY

We have already stated our conclusions that the Type 2 writing comprises, apart from its eight vowels, a syllabary consisting of symbols which are all of consonant-plus-*i* phonetic value, that these values are the same as the names of the alphabetical characters taught by a castaway Trukese party in 1905, those characters having become converted into a syllabary as the result of their names being taken as having syllabic value. The Type 1 writing was developed through stimulus diffusion after a period of trial with Type 2 alone, when the inadequacy of the latter was recognized (a Woleai woman makes this statement in virtually the same words); it consists, with a very few exceptions, of characters whose values are all consonants suffixed by vowels other than *i*.

There are some examples of attempts at an early stage in the development of the writing to set down words with the use of Type 2 characters exclusively (Damm and Sarfert, 1935, p. 277). Thus *u/li/ge/t* is written with characters XIX/X/VIII/XVII, *bo/da/u* with XIV/XVII/XIX, *ja/li/gi/o/m* with I/X/VIII/III/XI, etc. We also have examples in tattooing and from modern informants who know only Type 2 writing. B., who knows both types and who writes her name as 1/20/21/16, gives as an alternative form X/XIII/XI/IV, all in Type 2. A., writing the island name *Sa/taa/wa/l*, writes it as 37/25/14/33, but gives alternatively XV/XVII/XII/X. Obviously the modern

method of writing, which uses characters of both types, is much more precise than Type 2 alone.

INVENTION AT FARAULEP

Informants from all the islands agree that Type 1 writing was invented at Faraulep, and the script is generally called *ishilh Foeshavlap* (writing of Faraulep). Even people who cannot read the writing, as far east as Puluwat, at once identify it by this name. Three informants (two Ifaluk, one Lamotrek) state that they learned Type 1 writing at Ifaluk from Faraulep visitors; another Ifaluk man says he learned it at Ifaluk from a man of Woleai origin who had long been a resident of Faraulep. Several Woleai people also give Faraulep as the place from which Woleai got its writing; three Woleai women learned the system at Faraulep, two of them shortly after the 1907 typhoon. Three Puluwat people, none of whom can read the script, say that Puluwat obtained it from a canoeload of Ifaluk voyagers. At Satawal a Faraulep man is said to have taught the Type 1 writing, which no one at this atoll now can read. There also appears to have been some instruction among various Central Carolinians when they worked together during Japanese times at the phosphate mines at Angaur, in the Palau group. We have several statements to the effect that the system was learned through exchange of letters between various of the islands.¹⁹ We have no other clues as to dispersal of the Type 1 writing.

Several informants give the names of the inventors, all of whom were residents of Faraulep.²⁰ Though the lists of names differ, there is considerable agreement among them. The claim by Faraulep natives

¹⁹ These letters were originally written on wooden boards or on coconut-leaf midribs. Nowadays, letters written on paper are exchanged.

²⁰ Lists of inventors, as given by different informants, follow. We attempt to equate names of inventors in the different lists by preceding them with numbers.

Hafeleliyal	Malang	Lügetal	4. Tairu	Mathlyolong	5. Yairong
1. Sagiyeimar	1. Sagiyeimar	Taiyor	Gaflelimar	Pierong	Tarop
Hafiliyalo		2. Seghuuri	Yatelagh	3. Igemor	2. Salgouwe
		Marotiuw	2. Seghui	Hetuobul	4. Tairuiwe
		3. Igemor	Soghorub		
		4. Tairul			
		Willmar			
		5. Yairong			
		Rafiteg			
		Uchlimar			
		Ghillbwe			
		Wolbwe			

All of these alleged inventors are now dead, except the person whose name is last on the fifth list; she is a Woleai woman who has lived at Faraulep since before the invention, but she herself does not claim to be one of the inventors. The Lamotrek man referred to above states he learned the Type 1 script from a Faraulep man named Sagawi who came to Ifaluk when he was there; this is probably the person identified by No. 2. One of the Ifaluk men learned the script from the two men in the second list, who came to Ifaluk from Faraulep. And a Woleai woman who learned to write at Faraulep had as her teachers the four men in the sixth list.

that the Type 1 writing was invented at Faraulep, the support for this claim by natives of other islands who state that they learned the writing at Faraulep or from Faraulep visitors, and the universal appellation of the writing, even among people who cannot read it, as *ishilh Foeshavlap*, leave us satisfied that the invention was made at Faraulep and was largely, if not entirely, the work of a group of Faraulep natives.

FOREIGN INFLUENCE

We are less satisfied about the possibility of alien influence. The Südsee Expedition reports state that at various times between 1900 and 1910 there was a copra station at Faraulep to which several Japanese seem to have been attached. One informant from Eauripik states that the Type 1 script was made at Faraulep by a Japanese named Soshaki or Soshiki, and that a Filipino named Serifino or Serbino may have helped. A Faraulep man states that the Faraulep people themselves invented the writing but were later helped by a Japanese and a Filipino. At Woleai a woman of that atoll, who learned the writing at Faraulep and who gives the names of four Faraulepese as the inventors, states that the Japanese helped by contributing two characters, Nos. XVI of Type 2 and 61 of Type 1, from Japanese *katakana*; these two characters do actually nearly coincide with two Japanese characters in both graphic form and phonetic value. A Woleai man living at Faraulep since shortly after the invention insists that the Japanese Soshiki definitely did not help, and a Woleai woman who has lived at Faraulep since before the invention (and who is named by others as one of the inventors) denies that the Filipino was involved. All other informants state simply that the Faraulep people whose names they give were the inventors. We examined the possibility of Filipino influence, remote though it might be; but none of the symbols of any of the Filipino scripts can be related to the Woleai symbols (see Gardner, 1943; Diringer, 1948; Conklin, 1953). We also point out that two characters in addition to Nos. XVI and 61 are similar in appearance to Japanese characters; these are No. 26, which resembles the Japanese *kanji* form for "sun," and No. 34, which is like the Japanese *kanji* form for "wood" or "tree"; together, with the addition of one stroke to character 34, they would stand for "Nippon," and undoubtedly Japanese goods labeled thus were available to or seen by these islanders. However, in neither case is the phonetic value of the symbol similar to the Japanese value, so no more than the graphic form could have been borrowed. Also, in the case of character 26, informants have identified it as a representation of a canoe outrigger platform, as will be seen. The evidence for Japanese influence goes no further, although

it is possible that the facts that *katakana* is a syllabary and that Soshiki may have been consulted by the inventors may have reinforced the idea of creating a syllabary, first stimulated through the names of letters of the Trukese alphabet having been taken as being their phonetic values.

DATE OF INVENTION

As for the date of the invention of Type 1 writing, native informants state that it occurred "after the big typhoon," when the German administration had to evacuate many distressed people to islands in the same area less hard hit, as well as to Yap, Palau, and Saipan. This typhoon can be no other than the one that struck these islands March 27-30, 1907; other typhoons of which there is record are either too early or too late. Now the Südsee Expedition ethnologists worked in all the islands we are concerned with during November and December of 1909, and found the writing as far east of Faraulep as Puluwat. The invention must therefore have occurred between these dates, and would probably have been closer to 1907 than to 1909 to have had time to spread so far by 1909.

DERIVATION OF CHARACTERS

The form of the characters and their values suggest several possibilities concerning their derivation, apart from the four which may be linked with Japanese characters. Some of the Type 1 symbols appear to be modified forms of the alphabetical signs of Type 2. Thus character 3 is apparently an altered T, with the value changed from *ti* to *ta*. Using the same criteria of resemblance in form and value, character 8 would be derived from R, 11 from M, 12 from N, 33 from L, 40 from S, 48 from N, and 66 from F.

Other characters, as their graphic forms show, are attempts to represent natural or artificial objects, and the values of these characters are also the same as or close to the names of such objects. These constitute a kind of rebus writing. Among such characters we may list the following identifications made by informants:

5. Sprouting coconut
9. Bird's wing
13. Ulcer, boil
14. Canoe (represented under sail)
16. Forked branch used for hand net and flying-fish net
19. Portion of bonito
26. Canoe outrigger platform
28. Fish backbone
29. Trigger fish
30. Perfume bottle
31. Woman's breast

- 32. Midrib of coconut palm leaf (showing leaflets to either side)
- 35. Saw
- 36. Coconut palm tree
- 41. Porpoise
- 43. Lure of bonito hook
- 45. Leaf
- 53. Leaf of *Hibiscus tiliaceus*
- 56. Fishhook (modern type)
- 60. Canoe seat
- 64. A plant bearing this name

Nos. 29 and 41 have the same graphic form and the same names as conventionalized tattooing elements, and may have been taken directly from tattoo design rather than from the animals they represent. No. 24 also may be a tattooing design.

Some other proposed identifications, made not by informants but by the authors, using the same criteria of similarity in form and name, are:

- 2. Tattooing-rake handle
- 10. Composite bonito hook
- 15. Mast
- 38. Cock's tail feather
- 42. Ear ornament consisting of two interlocking rings
- 44. Fingernail

Brown also suggests that No. 12 is "bamboo" and No. 37 is "knife," but the resemblances in these cases strike us as elusive.

The fact that the characters are so frequently of rebus type may indicate that the inventors became preoccupied for a time with this principle of representation during their development of the system, and that some of the gaps in our identifications might be filled by further research in the vocabulary of material culture. It is of interest also that the phonetic value of the Type 2 character *N* (No. IX) is also the native word for "tooth," which the form of the character resembles, especially in the variant form given by C. Perhaps it was this coincidence which first suggested the rebus principle.

Of the other characters, some may well have been borrowed from decorative design elements, but we have not recognized any except those already described. Most of the others are very likely the product of pure imagination. Indeed, this must needs be the case, for Carolinian dialects in these islands are extremely deficient in words consisting of open monosyllables, upon which the syllabary is based, and even more so in such words which can be concretely represented.

We should note that Brown's list, but none of our lists, includes several symbols (Nos. 14, 31, and 43) whose attributed values are shown as closed monosyllables. It is possible that he misheard the sounds: certainly the word for canoe (No. 14) is *wa*, not *warr* as Brown

writes it, in the Central Carolines as far east as Truk; it becomes *war* only beyond Truk, at Ponape. Similarly the name of the bonito hook lure (No. 43) has no final consonant as Brown gives it. The female breast (No. 31) is indeed *tüt*, as Brown has it (*tuut* in Smith's orthography), just as the trigger fish (No. 29) is properly *pup*, but in the syllabary No. 31 becomes *tü* (*tuu*) and No. 29 becomes *pu*, in our lists; the words for these objects seem to be compounded forms of older roots (Goodenough, 1953, p. 16, and personal communication), and these compounds are apparently sufficiently transparent to the natives to allow isolation of the open syllables for the purpose of including them in the syllabary. Possibly this was done because of paucity of open monosyllabic words in the language. A similar process may have resulted in the discarding of final consonants of still other words which may have been utilized for the syllabary, but which we have not been able to identify in such altered form as belonging to the rebus type.

ANALYSIS OF THE WRITING

PHONEMES, PHONEMIC COMBINATIONS, AND CHARACTERS

We wish now to examine the actual writing and its adequacy to represent the language.

According to Smith (1951) the Woleai language has 50 phonemes. There are 11 vowels which occur both long and short, 2 vowels occurring only short, the semivowels *w* and *y*, and 24 consonants. For these phonemes Smith has developed an orthography in roman letters whose official adoption has been proposed to the Trust Territory administration; we will use it in the remainder of this study, as we have done in the figures and tables.²¹

²¹ Smith's published work is nontechnical in language, and his phonemes were established by means of minimal pairs. The values indicated below are, in Smith's words, "only a meager approximation indeed." For this reason we are not satisfied that our transcription in his orthography of the attributed values of the various characters in figs. 25 and 26 is always accurate. His description of the orthography, which is adapted for use without diacritical marks, is as follows:

a	father	b	upward
ah	fa-ther	c	juice
aa	fat	ch	choose
aah	fa-t	d	bad
ae	fed	f	aloof
aeh	fe-d	g	Bach
e	father	j	(a strong "h")
ee	safe	k	kid
eeh	sa-fe	l	bottle (Brooklynese)
i	sea	lh	balle (French)
ih	sea-	m	some
ii	sit	mw	someway
o	oak	n	man
oh	oa-k	nh	manikin
oa	off	ng	sing
oab	o-ff	ngh	singer
oe	hors d'oevres	p	up
oeh	hors d'oe-vres	r	"British" (trill "r")
u	boot	rw	Irwin (trill "r")
uh	boo-t	s	sow
uu	Nürnberg	sh	show
uuh	Nü-rnberg	t	pat
v	(like "oe" but with tip of tongue	th	pit-e-pat
vh	curved up and back)	z	adze
w	wood	Hyphen (-)	used for on-glides or excrescent vowels in reduplicatives.
y	yes		

From Brown, Damm, Sarfert, and Someki, and from our various informants we have a total of 97 characters (78 of Type 1 and 19 of Type 2) which are used to write the Woleai language. All of these characters, except those which represent vowels alone, have syllabic values of the consonant-plus-vowel or semivowel-plus-vowel pattern.

Smith's phonemic analysis would indicate that there is a theoretical possibility of 624 such syllables (24 consonants and 2 semivowels combined with 24 vowels); with the addition of the 24 vowels when these form independent syllables, there might be altogether 648 symbols.

Of course, it is most unlikely that all 624 combinations actually occur in the language. We have assembled from Smith's text materials a list of 301 Woleai words written in his orthography, and in table 1 the frequency of occurrence of all syllables among these 301 words is shown. There actually occur only 162 syllables of the consonant-plus-vowel and semivowel-plus-vowel types, as well as 13 syllables composed of independent vowels, a total of 175. It is striking that the phonemes *d* and *ngh* do not appear to occur in syllable-initial position at all, but in these 301 words occur only terminally. Some of the columns headed by other consonants (e. g., *ch*, *j*, *n*, *rw*, *th*, *z*) have only one or two entries under them. More than 175 different syllables must, of course, occur in the language. Our informants have written for us 222 of the 301 words (see table 2), have failed to use 21 of the symbols (VI, 7, 9, 24, 30, 44, 54, 55, 57, 61, 63, 64, 69, 70, 71, 72, 73, 75, 76, 77, 78), and use 3 of them only as terminal consonants (5, 47, and 52). Presumably the attributed values of these symbols are not the same as those of any other symbols, so failure to use them would mean that the appropriate syllables do not occur in these particular words but may very well occur in others. Even so, it is unlikely that more than, say, 250 or 300 syllables actually occur in Woleai speech. In the first 50 words (not counting repetitions) of Smith's text there occur 62 different syllables; in the next 50 words 29 more syllables occur; in the next 50, 18 others; in the 222 words written for us by our informants, there are altogether 157 different syllables; and in the total of 301 words taken from Smith, only 18 more or a total of 175. (These 18, which we do not have written in the native script, are: *bvh*, *fe*, *kii*, *loe*, *loeh*, *lhii*, *me*, *mwah*, *rah*, *ree*, *soe*, *shii*, *waah*, *wach*, *wo*, *yaa*, *yaah*, *yoe*, in Smith's orthography.) If a curve is projected on the basis of these figures, it appears to flatten out at something under 250 syllables in 750 or 800 words.

LENGTH OF VOWEL NOT DISTINGUISHED

We may reduce still further the possible number of syllables in the writing. The distinction between long and short vowels does not

seem to be utilized. We are not certain of the phonetic values of some of the symbols, but when we analyze words which informants have written for us we are seldom confronted by any two characters which seem to be distinguishable only on the basis of difference in vowel length; rather, when a native writes the characters for two syllables which contain the same consonant and whose vowel suffixes are identical except for being short in the one case and long in the other, he almost always uses the same character to represent both. The following examples (see table 4), in Smith's orthography, show this to be true (in each case *h* following the vowel indicates length):

<i>Syllable</i>	<i>Character used (and number of times so used)</i>
i.....	IV (44), III (1)
ih.....	IV (6)
u.....	XIX (11), XIX+39 (2)
uh.....	XIX (2)
uu.....	16 (4), IV (4)
uuh.....	16 (2)
v.....	16 (6), IV (1)
vh.....	16 (1), XIX+14 (1)
bu.....	29 (5), 59 (3), 13 (1)
buh.....	29 (1)
fa.....	32 (40), 66 (1)
fah.....	32 (2)
ga.....	46 (29), 50 (4), 74 (3)
gah.....	46 (2)
gi.....	VIII (26), VIII+III (1)
gih.....	VIII (2)
la.....	1 (24), 6 (1), 33 (1)
lah.....	1 (3)
li.....	X (5)
lih.....	X (2), 36 (1)
lha.....	1 (3), 33 (3)
lhah.....	1 (4)
ma.....	23 (9), 21 (1), 11 (2)
mah.....	23 (7), 21 (1)
maa.....	23 (12), 11 (1)
maah.....	23 (7)
mae.....	11 (24), 19 (2), 23 (1), 34 (2)
maeh.....	11 (2), 21 (1), 23 (1)
pa.....	43 (29), 26 (1)
pah.....	43 (1)
pi.....	XIV (5), XIV+III (2)
pih.....	XIV (7), XIV+III (1)
roe.....	35 (2)
roeh.....	35 (1)
sa.....	37 (7)
sah.....	37 (1)
see.....	40 (2), 40+IV (3)
seeh.....	40+IV (3)
shi.....	XIII (15), XIII+III (1), XV (1)

<i>Syllable</i>	<i>Character used (and number of times so used)</i>
shih.....	XIII (2)
shv.....	28 (1), 28+16 (1)
shvh.....	28 (1), 40 (1)
ta.....	3 (18), 18 (1), 25 (2)
tah.....	3 (13)
to.....	17 (22)
toh.....	17 (2)
tuu.....	31 (5), 31+16 (1)
tuuh.....	31 (1), 31+16 (1)
ya.....	I (50), III (1), IV+III (1)
yah.....	I (3)
yoa.....	XVI (1)
yoah.....	XVI (2), I (1), II (1)

It will be noted that, by and large, the frequency of occurrence of long vowels is much lower than that of short vowels. Perhaps for this reason the natives of the Woleais have found it unnecessary to invent characters which make the distinction.

Instead of 648 theoretically possible combinations, we have then only 338 (24 consonants and 2 semivowels combined with only 13 vowels), and 13 vowels which can occur not in combination.

VOWEL CHARACTERS

Of the 97 characters that we have found, a number have only vowel values; just how many is not certain. In table 1 it will be seen that of the 24 (both long and short) vowel phonemes in the Woleai language, only 13 actually occur as independent syllables in the sample of 301 words. Possibly if we had more than 301 words, more of the 24 vowels would appear. The other 11 vowel phonemes occur only in syllabic combinations. Of this 13, 4 are long vowels and in all words that informants have written for us they are represented by the same characters that stand for their short forms. This would leave 9 vowel phonemes for which characters would seem to be needed.

Now among our total of 97 characters there are some 13 which may or may not be intended to stand for vowels: I, II, III, IV, V, VI, XII, XVI, XIX, 14, 16, 39, and 72. (Possibly No. 74 should be included among them.) In the 222 words written by our informants (see table 2), only 3 of these 13 characters never represent semivowel-plus-vowel syllables (although they may have semivowel values when used terminally). Thus character IV usually represents the phoneme *i*, and also occurs as *ee*, *ih*, *ih+a*, *ih+y*, *uu*, *v*, and *-y*; it never appears in a written word in the form semivowel-plus-vowel. Similarly XIX is always *u*, *uh*, or *-w*; and 16 is always *uu*, *uuh*, *v*, *vh*, *i+-w*, or *-y*. Four others of the 13 characters may occur either as vowels alone or with semivowel-plus-vowel values: thus character I can be *a*, but also

ya, yah, yae, or yoah; III is *ae, ee, or i*, but also *ya, yae, ye* and *-y*; XVI is *oa*, but also *yoa, yoah, and yoeh*; and 39 is *o* once, otherwise *wa, waa, wae, we, woe, -w*. Four other characters of these 13 appear only with semivowel-plus-vowel values: II is *yoah* in its lone occurrence; V is *we, woa, or yoeh*; XII occurs in our examples only as *wih*; and 14 is *wa, wae, or woa*. We have no examples of words containing characters VI or 72. (See tables 2 and 3.)

It is apparent that there is considerable variation in vowel value in these characters, as there must needs be if they are to represent all 13 (or 24, if we consider length) vowel phonemes when these phonemes do not enter into syllabic combinations with consonants and semi-vowels. If we eliminate the 4 characters among the 13 that seem to occur only with prefixed semivowel values and if we disregard characters VI and 72, which do not occur in our 222 written words, we have left just 7 characters which may be used to represent the 9 (or 13, if we consider length) vowel phonemes which actually occur as independent syllables in the 301 words taken from Smith (table 1).

It is likely that additional samples of writing from more informants would clarify matters; it is possible that all 13 of these characters may be read indifferently as simple vowels or with initial *w-* or *y-*. But from the evidence at hand, if we do not consider the three characters (IV, XIX, and 16) which do not seem ever to have the value of semivowel-plus-vowel, and ignoring for the time being variation in vowel value of the others among the 13 characters, there remain 94 characters out of the total of 97 to represent all of the possible syllabic combinations. It is obvious that the system is inadequate for truly phonemic representation, and that many of the 94 characters must serve for several combinations.

LACK OF EXACT CORRESPONDENCE OF CHARACTERS AND SYLLABLES

This conclusion is further borne out when we examine the range in value of the various characters as they are actually used in the writing. We have seen how wide this range is for the 13 characters we have just discussed. Table 3 lists all the syllables occurring among the 222 words which we have been able to obtain in the native script, arranged according to the conventional numerical sequence of figures 25 and 26. We see that character 4, for example, is used for at least 6 different syllables—*ba, baah, bae, be, bee, and boe*; character 33 is used for 11—*la, lae, le, lee, lii, lha, lhae, lhe, lhi, nhae, dhe*; character 50 serves for the syllables *ga, gae, ge, ka, ke, and kee*; etc.

But not only must one symbol serve for several different syllables. It is apparent that the same syllable may be represented by different

symbols. Table 4, which lists in alphabetical order all the syllables which occur in the 222 words, illustrates this point; for example, the syllable *lhi* is written by one native with character 33 three times, character X 25 times, X+33 once, and X+IV once, and by a second native with X three times and 33+X once; similarly *pu* is written with characters 10, 13, or 59; *sha* with 18, 20, or 37; etc.

These two phenomena—the use of one symbol for several syllables, and the representation of one syllable by several symbols—explain in part the facts that the name or attributed value of a symbol, as seen in the various lists in figures 25 and 26, sometimes differs, and that in the writing of words the attributed value occurs only part of the time as the actual phonemic shape of the syllable the symbol is intended to represent. It would appear that when it is necessary to represent a sound which differs from the attributed value of any character, a choice may be made among two or more characters whose attributed values are close phonologically. For example, we have not recorded *tv* as the attributed value of any one character (it is possible, of course, that we have misheard some of the tape-recorded values), but in writing the word *fa/tv/lh* one native uses 32/31/33 and a second uses 32/XVII/33; symbol 31 is otherwise used by the first man for *tu* and *tuu*, and XVII by the second man for *ti* and *tii*. It would seem that each man has chosen, to represent the syllable *tv*, for which neither seems to know a character which has this as its attributed value, a character with an attributed vowel value on either side of it in articulation.

EFFECT OF DIALECTS

Some of the differences in choice of character by different natives may be due to dialect difference, but we have no way of assessing its effect, since such differences as may exist have not been determined. The only statements that Smith (1951) makes on this point are as follows (p. 40): "Islanders . . . may have difficulty in deciding on 'a' or 'aa' depending on their island of origin. These are separate phonemes on Weleeya (Woleai) and Foeshavlap (Faraulep) but perhaps not on Yaurwpiig (Eauripik). This is of course independent of the fact that some words are pronounced slightly differently on different islands"; and (p. 27): "On Eauripik 'tafeey' is pronounced 'tafee' and 'maah't' is pronounced 'maeht.'" (R. of Ifaluk apparently hears *ta/fee/y*, not *ta/fee*, for he writes the word with three characters: 3/66/III; and he distinguishes *maah/t*, which he writes 23/25 or 23/17, from *maeh/t*, 21/40.) The occasional use by various informants of two, or even three, characters for what, in Smith's orthography, should be a single syllable, would also suggest dialect differences not recorded by Smith; thus, in the following examples of syllables written by

Smith as consonant-plus-*ee* or consonant-plus-*eeh*, the informants write an extra character, namely IV, apparently for an additional vowel:

<i>bee/yae</i> -----	R.: 4 + IV/III
<i>kee/i</i> -----	R.: 50 + IV/III
<i>li/mee/g</i> -----	R.: X/11 + IV/50
<i>rwee/g</i> -----	R.: 47 + 39 + IV/50
<i>see/g</i> -----	R., C., and M.: 40 + IV/50
<i>seeh/gi</i> -----	R., C., and M.: 40 + IV/VIII

REPRESENTATION OF FINAL CONSONANTS

The choice of a character to represent a final consonant seems to be much more capricious than the choice of a character to represent a full syllable. We have already pointed out that the attributed value of a character loses its vowel portion when the character is used for the terminal consonant of a word. In table 4 it will be seen how wide a choice of character seems to be permissible for such use. Nevertheless, some regularities are discernible. For example, 18 words terminating in *-g* are listed in that table, some of them written several times and by as many as three natives; for the *-g* the informants have without exception used character VIII in four words, in four other words they agree on character 2, in another five words they all use character 41, and they invariably write character 50 in five more. How are we to explain such consistencies in usage, sporadic though they are? In some Malayo-Polynesian languages there occurs a final vowel that is so weakly pronounced as to seem inaudible. While this phenomenon does not appear to be a feature of Woleai speech today, it may well have been so in the past; and if we may credit the inventors of the Type 1 script with ability to reconstruct the ancient *pu* from modern *pup* and *tuu* from *tuut*, as previously described, it is possible that in these instances the character chosen to represent *-g* is the one whose full syllabic value includes the vowel sound which was formerly terminal.

In the use of final characters in some words there is a hint that perhaps the informants are anticipating a vowel which would appear only when additional syllables were suffixed to the same words. Thus we have character 33 for *-lh* in the word *mwae/lh*, and also for *lhe* in the compound *mwae/lhe/we*; 33 is used again in *mi/si/lh* and in the compound *mi/si/lhae/lh*; but in the word *rae/lh*, informants use for *-lh* either 33 or X, as though this word might be compounded in different ways, and in the one compound form which we have in native script, *rae/lhi*, the syllable *lhi* is written with the character X.

Occasionally the vowel preceding the final consonant seems to influence the choice of character for that consonant. Thus *-l* is almost always written with character 33, occasionally with X; but character

36, which is used for the syllable *luu* in the word *Fa/la/luu/s* and for *lv* in the word *fae/lv/w*, also represents *-l* in the words *vh/l* (as written by one informant out of two) and *uuh/l* (by both of two informants); in other words, 36 seems to be the choice in these instances because the vowels of the preceding syllables are similar to the vowel portion of that character's full syllabic value. Again, character 2, which usually has the value *go* (see table 3), is used terminally as *-g* only in the words *yae/lo/g*, *So/w/g*, *to/g*, and *toh/g* (but not in *sho/g*), that is, in words where the preceding vowel is *o*. And the only times character 31 is used terminally are in the words *tuu/t* and *tuuh/t*, character 31 otherwise having the value *tu*, *tuu*, *tuuh*, or *tw*; in practically all other cases of *-t* informants agree in the use of character 25.

However, the principle which seems to develop from the foregoing does not seem to apply to many of the other terminal consonants. In some cases it would seem that it is the consonant, not the vowel, of the preceding syllable that determines which character is to be used for the final consonant of a word. Thus all informants use character 6 for the *-n* of *bu/n* and *-nh* of *bu/nh*, but use 33 or 36 for the *-nh* of *pu/nh*. Again, both C. and R. agree on character 12 for *-ngh* in *tah/ngh*, but 52 for *-ngh* in *lhah/ngh*; all informants use IX for *-ng* in *cha/ng*, *lah/ng*, and *tah/ng*, and all of them use 52 for *-ng* in *lhah/ng* and *u/ng*; they agree again on XIII for the *-c* in *wih/c* and on 5 for the *-c* in *mwoa/c-mwoa/c*; and there are further cases of such unanimity in choice of character to be used for final consonants. Perhaps there is some component of the phoneme which determines such seemingly arbitrary choice.

There is also some evidence, although not so strong, that sometimes the reverse occurs; that is, that the final consonant may determine which character is to be used for the preceding syllable. For example, R. and C. use character 47 consistently for final *r* or *rw*. In the words *sorw*, *raesorw*, *galiisorw*, and *josoar* the syllable preceding *-r* and *-rw* is written with character 68. The only other time 68 is used is for the syllable *sho* in the word *jo/sho/s*; whereas for *sho* in the word *sho/g* character 45 is used. How is this to be explained? It would seem that R. has misunderstood the word *joshos* and taken the final consonant, *-s*, as *-r* or *-rw*, since he writes 47 for it, instead of XV or 62 as he does for all other cases of *-s*. It therefore suggests itself that there is some kind of relationship between these two characters, 47 and 68, and that the use of the former requires the use of the latter.

Whether such relationships are of a functional nature, whether the system of spelling has in the course of years of use become arbitrarily conventionalized, or whether some aesthetic judgment is applied which prevents or encourages the juxtaposition of certain characters, is a matter that we are unable to settle. In many cases, perhaps in most

cases, there seems to be no clear rule; rather it may be whim which often dictates which of several final characters is to be used. Nevertheless, examination of table 4 gives the impression that some rules are operative.

COMPARISON OF NATIVE TEXTS

The foregoing analysis is, of course, based entirely on examination of the 222 words in Smith's orthography that we have been able to get natives to write in the Caroline script. Smith's text, which is addressed to the natives and which consists of a guide to his proposed system of spelling, is naturally limited by his vocabulary and mode of expression. (See fig. 27.) But we have available to us two other texts, of native composition, by R. and S.,²² both of Ifaluk (fig. 28). They have not been tape-recorded or put into Smith's orthography, but they will enable us to discuss frequency of occurrence of the symbols. S. uses 68 characters out of the 97, a total of 1,178 times; R. uses 65, a total of 483 times. Of the symbols (fig. 25, cols. N and O; fig. 26, cols. N-P) given by R. separately from the text, 10 do not occur in the text; and occurring in the text but not in the lists are 6 symbols. In other words, he knows 75 of the 97 characters, but in writing he makes use of only 65, of which 3 are the apparently simple vowels (IV, XIX, 16), so that he limits himself to 62 characters representing syllabic combinations for the 624 possible combinations. Of these, 11 are used only once, 8 only twice, and 10 only three times.

We have no comparable list of symbols and attributed values from S. with which to compare his text. He does not use in the text 29 of the symbols known to us; 22 of these 29 are also absent from R.'s text, and 10 are among those apparently unknown to R. Of the 65 which he uses, 10 occur only once, 4 twice, and 7 three times.

Percentagewise, some comparisons between the two men are of interest, assuming that we have adequate samples of this universe, speaking statistically. Character 7, not used at all by R., occurs with a frequency of 4.4 percent of the 1,178 characters written by S. Character 46 occurs in R.'s text with a frequency of 0.2 percent, but S. uses it 28 times as often, with a frequency of 5.6 percent. The respective figures for R. and S. for character 35 are 2.1 percent and 6.0 percent; for 50, 6.0 percent and 3.4 percent; for 39, 3.9 percent and 1.9 percent. There is less significance in the difference in occurrence of other characters.

Evidently, then, the system is flexible enough to permit of considerable freedom in expression of preference through employment of one character or another. In order of descending frequency, the

²² S. is the man described by Spiro (1950) as a psychopath. He is kept confined at Ifaluk in a coconut log hut. Whether this fact diminishes the value of the comparison between his writing and that of R. we are not prepared to state.

I Γ K Γ Δ □ □ Γ ~ ∂ H () K θ λ
 ∂ ∂ ∂ ∂ ∂ ∂ ∂ □ □ Γ K ρ
 ∂ ∂ T ρ N ∂ Γ V ∂ N M Γ ∂ ±
 ∂ □ □ N ∂ Γ V ~ ω γ ∂ ∂ () ∂ X □
 λ X V ρ ∂ ∂ ∂ ∂ ∂ ∂ K K ρ
 ∂ N C ∂ K ∂ K N Δ □ □ N I N Γ ~
 ∂ ~ ∂ ∂ X ∂ ∂ ∂ I ∂ ~
 I ∂ M Γ I B Γ ∂ □ □ N I N Γ ~
 I ∂ N I ∂ M Γ T ρ ∂ Γ V ∂
 ∂ ∂ ∂ K ∂ ρ

FIGURE 27.—Paragraph from Smith's roman text (1951, pp. 3-4) as written in native script by R. of Ifaluk. (Words are shown separated by spaces for purposes of clarity; in the original they run continuously.)

(For explanation, see opposite page.)

preferences of the two men for their most frequently used characters are:

	R. Percent		S. Percent
X.....	7.0	IV.....	8.0
50.....	6.0	X.....	6.6
III.....	5.8	35.....	6.0
IV.....	5.4	46.....	5.6
25.....	4.7	7.....	4.4
33.....	4.7	33.....	4.2

In a single person's writing, however, there is considerable consistency. Part of R.'s text is written twice. The duplicated portion contains 187 characters in both versions, which are identical except for the following changes in spelling in the second version: substitution of IV for 16 in one word; 37 for 40 in another word; 38 for 17 in a third; 6 for 33; the sequence III-50 for IV-46; and the sequence 6-52 for 1-2 in still other words. We are probably dealing here again with combinations of phonemes whose values lie within a range of overlap between values associated with two different characters, so that one choice is as good as the other.

EXPLANATION OF FIGURE 27

Characters used in figure 27 shown by numbers assigned to them (refer to figures 25 and 26). Text and translation as given by Smith (1951, pp. 3-4, 33).

IV 33	VIII 33	46 26 3 33	XV 4	32 17 VIII	45 41
i /lha/	gi/ l	ka/pe/ta/ l	si /bae	fa/to/ gi	sho/ g
4	III 4	39 39	46 26 3 33	VIII 20	
bae	yae/be	wae-wae	ka/pe/ta/ l	gi /sh	
39 39 ?	2 42 X	39 33 I	35 X	11 33	3 IV
wae-wae/lh	go/zv/lhi	we/lee/ya	rae/lh	mae/lae	ta/ i
46 26 3 X	39 33 I	40 23 36	III 4	17 XIX 1 26	
ka/pe/ta/ l	we/lee/ya	si /mii/ lh	yae/be	to/ u /la/ p	
41 1	I 20	4	III 4	23 20 15 VIII	VIII 20
gv/la	ya/sh	bae	yae/be	ma/sha/ra/ g	gi /sh
35 X	50 35 VIII 35 VIII X	46 26 3 X	IV IX 33 XV		
rae/lh	ge/ra/ gi /roe/ gi /lhi	ka/pe/ta/ l	i /nge/lii/ s		
4	XV 4 41 1	4	III 14 IV 35 XV		
bae	si /bae/gv/la	bae	yae/wa/ v /rii/ s		
IV III	11 33	IV XIII 33	46 26 3 X	IV IX 33 XV	
ih / y	mae/lhae	i / shi /lh	ka/pe/ta/ l	i /nge/lii/ s	
IV 39 12	IV III	11 33	2 42 ?	39 33 I	12
i /woe/ngoe	ih/ y	mae/lhae	go/zv/lh	we/lee/ya	nge
III	23 20 15 VIII	35 20			
yae	ma/sha/ra/ g	roeh/sh			

Ilhagil kapetal sibae fatogi, shog bae yaebe wae-wae kapetal. Gish wae-waelh All words written in this way are written just as they sound. We spell Woleai gozvlhi Weleeya, raelh maelae tai kapetal Weleeya. Simiilh yaebe toulap gvla sounds, not Woleai words. Therefore Woleai has a

yash, bae yaebe masharag gish, raelh geragiroegilhi kapetal Ingeliis bae sibaegvla. much better and easier way of spelling than English has.

Bae yaewavriis ihy maelhae ishilh kapetal Ingeliis, iwoengoe ihy maelhae gozvlh It is difficult to spell the words of English but it is easy to spell the sounds

Weleeya, nge yae masharag roehsh. of Woleai.

SUMMARY

In 1905 an American missionary from Truk, Alfred Snelling, and a party of Trukese were cast ashore at Eauripik. Here they gave instruction in writing with the alphabet which had been developed in the Nomoi Islands. The natives of Eauripik took the names of the letters as being their syllabic values and converted the alphabet into a syllabary. These letters constitute the symbols we have called

T O B F K I W R N I B I W A N
 P I A P N W W T B P A N B Y Z
 T Y O M H I B A N T I P A N Y N A I W
 C O I B T N Y A O B B N C K A N T
 K O B T Y B O P R A N N Y P W F B
 B T B N P B K N B K A I O N O O I B
 W T B A I P A I B K R T K P Z C B B K B
 C T W D T N W O T T C T T A T O A B
 O A P A N N I I A B A P T C A
 W E B T C B I R Z T I T B M R R
 A A X K N B C O I B
 E D A R N W O B T T Y X O B

FIGURE 28.—A page of text from a song written by R., a man of Ifaluk.

Type 2. The syllabary diffused to Faraulep where the deficiencies of the writing became apparent, all consonant signs of the original alphabet now having syllabic values consisting only of consonants-plus-*i*. The Faraulepese, between 1907 and 1909, invented a whole new set of symbols, Type 1, taking some of the signs from their environment and their material culture and giving them as their values the names of these objects; other signs were made by altering the form of Type 2 symbols; a few may be of Japanese derivation; and some are the products of imagination. By 1909 the writing, of both types, had spread to eight atolls of the Central Carolines and it is still known on five of them today.

Previous authors have speculated that the writing represented the remains of a formerly more developed system, that it was related to scripts of the Asiatic mainland, that it was linked to Easter Island writing, etc. But it has been demonstrated that the Woleai syllabary represents a case of recent stimulus diffusion, like the Vai and Cherokee syllabaries.

The writing, which is still being added to by new inventors from time to time, represents only crudely the language it is used for. A symbol may be used for more than one syllable, and a syllable may be represented by more than one symbol. In time, more exact correspondence might develop. However, the writing will probably die out before this occurs.

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TABLE 1.—*Frequency of occurrence of syllables in 301 Woleai words*

[To illustrate: There are 4 occurrences of the syllable *a*, 1 of *ba*, 3 of *ca*, etc.]

	Vowels alone	b	c	ch	d	f	g	j	k	l	lh	m	mw	n	nh	ng	ngh	p	r	rw	s	sh	t	th	z	w	y	
-a	4	1	3	1	1	22	20	1	8	20	5	10	4	2				10	8		3	6	13			7	18	
-ah						2	1			2	2	4	2					1	1		1		6			1	1	
-aa		1				2						7						1	1				3			1	1	
-aaah												2						1	3		1		11			6	19	
-ae	8	8				5	1			4	7	7	2		1			3	3		1					1	1	
-ach																		3	7		2		6			5	1	
-ee		2				1	5		3	3	1	1			1	2		3	1	1	4		1					
-eeh	4	1				2			1	1	1	1						1	1	1								
-i	30	1				3	12			4	21	3	1			1		8	3		13	4	5					
-ih	5						1			2								3	1			1	1			1		
-ih					1		1		1	2	1	1						1	5			2	10			1		
-il	2						8	6		4								1	5			2	1					
-o																												
-oh							1					5										1						
-oa	1	1				1	1																					
-oah																												
-oe		2				1				2																		
-oeh													6						2		1		2					
-ul										1									1									
-ua																												
-uah	8	4								1																		
-uh	1	1																										
-uu	4									1	1																	
-uuh	1																											
-v	2						2			5																		
-v	1	1																										
Terminal consonants alone			3	3	3	2	22	1	2	20	33	1	4	3	3	13	4	11	8	9	7	12	18	9		15	12	

TABLE 2.—*Words written by Caroline Island natives in Caroline script*

[On left, words from Smith, in his orthography; on right, spelling of those words in native characters. Characters are shown by numbers assigned them in figures 25 and 26. Numbers in parentheses indicate number of times word is thus written, if more than once, by each informant. Double diagonals following the number of a character indicate that the character is apparently used for two successive syllables. Informant designations: R.=Maroligar; C.=Chiyemal; M.=Magilo; T.=Tachep; A.=Marutang.]

ae/ta	R.: III/3
ae/tae/i	R.: III/3/IV
ae/ta/i	R.: III/3/IV
ae/ta/i/fi/lh	R.: III/25/IV/VII/33
ae/to/u/la/p	R.: III/17/XIX/1/26
a/le/fah/pae/t	R.: I/33/32/66/25 (2)
baah/sh	R.: 4/20; C.: 4/20; M.: 4/20
ba/bi/o/rw	R.: 4/29/XVI/22
bae	R.: 4 (21); C.: 4
bae/s	R.: 4/XV; C.: 4/XV
bae/sh	R.: 4/XIII, 4/40; C.: 4/XIII; M.: 4/XIII
bae/y	R.: 4/III
bee/yae	R.: 4+IV/III
boa/d	R.: 13/XVII; C.: 13/XVII; M.: 13/XVII
boe/ga/re	R.: 4/46/35
buh/k	R.: 29/2
bu/n	R.: 29/6; C.: 29/6; M.: 29/6
bu/nh	R.: 29/6; C.: 29/6
ca/ng	R.: 18/12, 18/IX; C.: 18/12; M.: 18/12
ca/ngh	R.: 37/52
cha/ng	R.: 18/IX; C.: 18/IX; M.: 18/IX
ee/bae	R.: III/4
ee/tae	R.: III/25
ee/tae/mwa/lh	R.: III/3/19/33
ee/ta/i	R.: IV/3/33
faa/t-faa/t	R.: 32/25-32/25; C.: 32/25-32/25
Fae/la/la/p	R.: 66/1/1/26
fae/v/w	R.: 32/36/39, 66/36/39
Fa/go/sa/p	R.: 32/56+IV/37/26
Fa/la/luu/s	R.: 66/1/36/62
fa/lh	R.: 32/X, 32/33 (2)
Fa/ra/gi/ye	R.: 32/35/VIII/III
fa/th-fa/th	R.: 32/17-32/17 (2); C.: 32/17-32/17
fa/th-fa/thv/lhi	R.: 32/17-32/17/X (4); C.: 32/17-32/17/X
fa/tii/lh	C.: 32/XVII/33; M.: 32/XVII/33
fa/ti/lh	R.: 32/XVII/X; C.: 32/XVII/X; M.: 32/XVII/X
fa/to/gi	R.: 32/17/VIII (7); C.: 32/17/VIII
fa/tv/lh	R.: 32/31/33; C.: 32/XVII/33
fi/to/u	R.: VII/17/XIX+39 (2)
foa/ri	R.: 27/XVIII (3); C.: 53/XVIII; M.: 27/XVIII
Foe/sha/v/la/p	R.: 32/20/16/1/26, 66/18/16/1/26; C.: 66/18/16/1/26; M.: 66/18/16/1/26; T.: 66/18/16/1/26 (2)
ga/bu/ngh	R.: 46/13/IX, 46/59/58
ga/ch	R.: 46/28
ga/fi/tae/g	R.: 46/VII/25/VIII (6); C.: 74/VII/25/VIII
gah/th	R.: 46/17; C.: 46/17
ga/i/ga/bu/ngv	R.: 46/IV/50/59/58 (2)
ga/i/ma/ngi/y	R.: 46/IV/11/IX/III, 2/23/IX/III
Ga/la/ya/li/ma/ng	R.: 46/33/I/X/11/IX
ga/lii/so/rw	R.: 46/33/68/47 (2)
ga/mwoe/lha	R.: 46/19/33
ga/mwoe/lhae/lhi	R.: 46/19/33/X (3), 46/19/33/33, 46/19/33/X+33; C.: 74/19/33/X
ga/re	R.: 46/35, 50/35; C.: 74/omitted
ga/wae/waa/y	R.: 46/39/39/III (2); C.: 50/14+IV/39/IV
ge/pa/t	R.: 50/43/25; C.: 50/43/25; M.: 50/43/25
ge/ra/gi/roe/gi/lhi	R.: 50/35/VIII/35/VIII/X
gi/sh	R.: VIII/20 (5); C.: VIII/20
goa/mw	R.: 2/19 C.: 2/19
go/mw	R.: 2/34; C.: 2/49
go/sh	R.: 2/5; C.: 2/5; M.: 2/5
go/zv/l	R.: 2/42/33
go/zv/lh	R.: 2/42/omitted
go/zv/lhi	R.: 2/42/X (5), 2/42/33; C.: VIII/omitted/33+X
gv/la	R.: 41/1; C.: 74/1
I/fae/lhuu/g	R.: IV/66/36/41; C.: IV/66/36/41
I/gae/lha	R.: IV/50/1 (3)
Ih/a/j	R.: IV//46
Ih/mw	R.: IV/19; C.: IV/19
Ih/r	R.: IV/35
Ih/sh	R.: IV/XV
Ih/y	R.: IV/III (2), IV// (3)
I/le/gih/r	R.: IV/33/VIII/35; C.: IV/33/VIII/35
I/lha/gi/l	R.: IV/33/VIII/33; C.: IV/33/VIII/X
I/nge/lii/s	R.: IV/IX/33/XV (2)
I/shi	R.: IV/XIII (4), IV/XIII+III; C.: IV/XIII
I/shi/lh	R.: IV/XIII/33 (6), IV/XV/33, IV/XIII/1; C.: IV/XIII/X
I/shi/lhi	R.: IV/XIII/33, IV/XIII/X+IV
I/tae/lh	R.: IV/3/33
I/tae/lhi	R.: IV/3/X
I/ti/pae/lhi	R.: IV/XVII/26/X

TABLE 2.—*Words written by Caroline Island natives in Caroline script—Continued*

i/woe/ngoe	R.: IV/39/12
i/ya/ng	R.: IV/I/omitted
ja/lhae	R.: 46/33
jo-jo	R.: 2-2 (3); C.: 2-2
jo/sha	R.: 2/37; C.: 2/18
jo/sho/s	R.: 2/68/47
jo/soa/r	R.: 2/68/47
ka	R.: 46 (5)
ka/lh	R.: 50/1
ka/pa/tee/yae	R.: 50/43/25/III
ka/pe/ta/l	R.: 46/26/3/33 (6), 46/26/3/X (3); C.: 46/26/3/33, 46/26/3/X, 50/43/25/33
ka/pe/ta/lhl	R.: 46/26/3/X
kee/i	R.: 50+IV/III; C.: 46//
ke/pa/t	R.: 50/43/25 (14); C.: 50/43/25; M.: 50/43/25
ke/pa/te/ka/y	R.: 46/26/3/46/IV+III
lae	R.: 33
la/go/sha/g	R.: 1/2/18/41; C.: 1/2/18/41
lah/ng	R.: 1/IX; C.: 1/IX; M.: 1/IX
lhae/n	R.: 1/X
lhae/nh	R.: 1/X (2)
lhah/ng	R.: 1/52; C.: 1/52
lhah/ngh	R.: 1/52; C.: 1/52
lhl	R.: X (2)
lih/mw	R.: X/19; C.: X/11
lih/wa/nhae/y	R.: 36/39/33/IV
li/mee/g	R.: X/11+IV/50
maah/lh	R.: 23/36; C.: 23/36; M.: 23/36
maah/t	R.: 23/25, 23/17; C.: 23/25; M.: 23/25
maa/lhl	R.: 23/X
maa/sv/r	R.: 23/62/47; C.: 23/62/47
maa/t	R.: 23/25; C.: 23/25; M.: 23/25
maa/zv/r	R.: 23/62/47; C.: 23/62/47
mae	R.: 11 (9), 34 (2); C.: 11; M.: 11
maeh	R.: 11; C.: 11; M.: 23.
maeh/t	R.: 21/40
mae/lae	R.: 11/33 (7); C.: 11/1+III
mae/lae/l	R.: 11/33/33
mae/lhae	R.: 11/33 (2)
mae/lhae/l	R.: 19/33/33 (2)
mae/taa/lh	R.: 11/3/33 (2)
mah	R.: 23; C.: 23; M.: 23
mah/ch	R.: 23/20; M.: 21/28
mah/lh	R.: 23/36; C.: 23/36; M.: 23/36
ma/ngi/y	R.: 23/IX/III
ma/sha/ra/g	R.: 23/20/15/VIII (3); C.: 23/20/15/VIII
ma/tae-mae/tae/l	R.: 23/25-23/25/X
ma/th	R.: 23/17; C.: 23/17
mi/lh	R.: XI/33; C.: XI/33
mi/si/lh	R.: XI/XV/33
mi/si/lhae/lh	R.: XI/XV/33/33
mwaeh/lh	R.: 19/33
mwaeh/lhe/we	R.: 11/33/39
mwa/lhl	R.: 21/X
mwl/lh	R.: 67/33; C.: XI/33
mwoa/c-mwoa/e	R.: 34/5-34/5; C.: 49/5-49/5
mwoe/lac/lh	R.: 19/33/33
Na/mwoa/chii/g	R.: 1/34/20/VIII; M.: 1/49/20/VIII
nga/lhl	R.: 48/X
nga/li	R.: 48/X (2)
nge	R.: 12 (7)
nhe/pa/l	R.: 33/43/33 (4), 33/43/X
paah/l	R.: 43/IV; C.: 43/IV; M.: 43/IV
pah/nga/sh	R.: 43/48/20
pa/nga/lh	R.: 43/48/33 (3)
Pih/g	C.: XIV/50; M.: XIV/50
pih/pih	R.: XIV/XIV+III; C.: XIV/XIV; M.: XIV/XIV
pi/pi	R.: XIV/XIV+III; C.: XIV/XIV; M.: XIV/XIV+III
Pu/lo/wa/th	R.: 13/6/14/25
pu/nh	R.: 10/33; C.: 59/36
raa/sh	R.: 35/20
rae/lh	R.: 35/X (5), 35/33 (7), 35/33+X; C.: 35/omitted
rac/lhl	R.: 35/X (2); C.: 35/X
rae/so/rw	R.: 35/68/47
ra/ra/lh	R.: 15/15/33
re	R.: 35 (5)
re/bae	R.: 35/4 (4); C.: 35/4 (4)
roeh/sh	R.: 35/20
roe/sa/fa/to/gi	R.: 35/37/32/17/VIII
ro-ro	R.: 22-22; C.: 22-22
ro/w-ro/w	R.: 15/XIX-15/XIX
rwee/g	R.: 47+39+IV/50 (2)
Sae/pa/lh	R.: 37/43/33
sah/g	R.: 37/41

TABLE 2.—*Words written by Caroline Island natives in Caroline script*—Continued

Sa/taa/wa/l.....	R.: 37/25/14/33 (2); C.: 37/25/14/33; M.: 37/25/14/33; A.: 37/25/14/33
see/a/w.....	R.: 40/39 (6)
see/g.....	R.: 40+IV/50; C.: 40+IV/50; M.: 40+IV/50
seeh/gi.....	R.: 40+IV/VIII; C.: 40+IV/VIII; M.: 40+IV/VIII
see/mwoe/y.....	R.: 40/34/16 (2)
see/o/w.....	R.: 40/39
se/mwoe/y.....	R.: 40/34/16 (2)
sha/g.....	R.: 18/41 (3), 37/41
shih/m.....	R.: XIII/19; C.: XIII/19
sho/g.....	R.: 45/41 (5); C.: XV/omitted
shv.....	R.: 28; C.: 28+16
shvh/w.....	R.: 40/XIX; C.: 28/39
si.....	R.: XV (2)
si/a.....	R.: XV/I (3)
si/bae.....	R.: XV/4 (8); C.: XV/4
si/bae/gv/la.....	R.: XV/4/41/1 (3)
si/boe.....	R.: XV/4
si/fa/to/gl.....	R.: XV/32/17/VIII (2)
si/ga/l.....	R.: XV/46/33
si/mli/lh.....	R.: 40/23/36; C.: XV/XI/33
si/ti/pae/lhl.....	R.: XV/XVII/26/X
si/ya.....	R.: XV/I (3)
so/rw.....	R.: 68/47 (2)
So/w/g.....	R.: 42/XIX/2
ta/fee.....	R.: 3/66+III
ta/fee/y.....	R.: 3/66/III
tah/d.....	R.: 3/XVII; C.: 3/XVII; M.: 3/XVII
tah/l.....	R.: 3/33; C.: 3/33
tah/lh.....	R.: 3/X; C.: 3/X
tah/ng.....	R.: 3/IX; C.: 3/IX
tah/ngh.....	R.: 3/12; C.: 3/12
tah/t.....	R.: 3/25; C.: 3/25
ta/l.....	R.: 3/IV; C.: 3//
ta/pi/lh.....	R.: 18/XIV/omitted
Te/o/ma/l.....	R.: XVII/39/21/33
ti/li/gi/ae/lh.....	R.: XVII/X/VIII/III/X
ti/ri/gi.....	R.: XVII/X/VIII+III
toe/toe.....	R.: 38/38; C.: 33/38
to/g.....	R.: 17/2; C.: 17/2
toh/g.....	R.: 17/2; C.: 17/2
to/u/la/p.....	R.: 17/XIX/1/26 (3); C.: 17/XIX/1/26, 60//1/26
tu/tu.....	R.: 31/31; C.: 51/51
tuuh/t.....	R.: 31+16/31; C.: 31/31
tuu/t.....	R.: 31/31; C.: 31/31
tuu/tuu.....	R.: 31/31; C.: 31+16/31
uh/ng.....	R.: XIX/52; C.: XIX/12
u/lu/nhv/lhl.....	R.: XIX/65/65/X
u/ng.....	R.: XIX/52; C.: XIX/52
uuh/l.....	R.: 16/36; C.: 16/36
uu/r.....	R.: 16/35; C.: 16/35
uu/rw.....	R.: 16/47; C.: 16/35
uu/we.....	R.: IV/39 (4)
vh/l.....	R.: XIX+14/33; C.: 16/36
wae-wae.....	R.: 39-39; C.: 14-omitted
wae-wae/lh.....	R.: 39-39/omitted; C.: 39-39/X
We/lee/ya.....	R.: 39/33/I (14); C.: 39/33/I (6); M.: V/33+I/IV+III
wih/c.....	R.: XII/XIII; C.: XII/XIII
woa/lh.....	R.: V/X (2)
woa/lo/w.....	R.: V/6+XIX/39, 14/65/39
Woe/tte/ga/i/w.....	R.: 39/25/46/16//
yae.....	R.: III (2)
yae/be.....	R.: III/4 (10), I/4; C.: III/4 (2)
yae/be/ga/ch.....	R.: III/4/46/28
yae/fa/th.....	R.: III/32/17
yae/ga/fi/tae/g.....	R.: III/46/VII/25/VIII
yae/l.....	R.: III/33
yae/lo/g.....	R.: III/6/2
yae/mwoe/lh.....	R.: III/19/33
yae/tae/tae/l.....	R.: III/25/3/IV
yae/to/u/la/p.....	R.: I/17/XIX/1/26
yae/wa/l.....	R.: III/14/33
yae/wa/v/rii/s.....	R.: III/14/IV/35/XV
ya/f.....	R.: I/VII; C.: I/VII; M.: I/VII
yah/f.....	R.: I/66; C.: I/66; M.: I/66
ya/r.....	R.: I/35
ya/re/maa/t.....	R.: I/35/23/25; C.: I/35/23/25 (2)
ya/re/maa/taa/l.....	R.: I/35/23/3/X; C.: I/35/11/3/X
ya/sh.....	R.: I/20 (12), I/40
ya/th.....	R.: I/17
ya/to/we.....	R.: I/17/39
Ya/u/rw/pii/g.....	R.: I/XIX/8/XIV/50, III/XIX/8/XIV/50
yoah.....	R.: XVI; C.: II
yoah/la/gii/lh.....	R.: XVI/1/VIII/X; C.: I/6/omitted/X
yoa/rw.....	R.: XVI/22
yoeh.....	R.: XVI; C.: V

TABLE 3.—*Characters and their actual syllabic values, arranged according to sequence of characters in figures 25 and 26*

[Numbers in parentheses following a word indicate number of times, when more than once, the italicized syllable within that word is written by each informant with the designated character. Plus signs: in the first column plus signs indicate when two characters are used for a single syllable; in the second column they indicate when two syllables are written with one character. Informant designations: R.=Marollgar; C.=Chiyemal; M.=Magilo; T.=Tachep; A.=Marutang.]

Character No.	Syllables represented by character	Informant	Words in which character is used
I.....	a	R.	<i>sia</i> (3), <i>alefahpaet</i> (2)
	ya	R.	<i>yaremaataal</i> , <i>Weleeya</i> (14), <i>yash</i> (13), <i>siya</i> (3), <i>yatowe</i> , <i>iyang</i> , <i>Galayalimang</i> , <i>yaremaat</i> , <i>Yaurwpiig</i> , <i>yar</i> , <i>yath</i> , <i>yaf</i>
		C.	<i>yaremaataal</i> , <i>Weleeya</i> (6), <i>yaf</i> , <i>yaremaat</i> (2)
	yah	M.	<i>yaf</i>
		R.	<i>yahf</i>
		C.	<i>yahf</i>
		M.	<i>yahf</i>
	yae	R.	<i>yaebe</i> , <i>yaetoulap</i>
	yoah	C.	<i>yoahlagiilh</i>
II.....	yoah	C.	<i>yoah</i>
III.....	ae	R.	<i>tiligaelh</i> , <i>aetoulap</i> , <i>aetal</i> , <i>aeta</i> , <i>aetaifilh</i> , <i>aetael</i>
	ee	R.	<i>etae</i> , <i>etaemwalh</i> , <i>eebae</i>
	i	R.	<i>keet</i>
	ya	R.	<i>Yaurwpiig</i>
	yae	R.	<i>yaebe</i> (10), <i>yaewavriis</i> , <i>yaetaetaei</i> , <i>yaebegach</i> , <i>kapateeyae</i> , <i>yaemwoelh</i> , <i>yaelog</i> , <i>yael</i> , <i>yaefath</i> , <i>yaewal</i> , <i>yaegafitaeg</i> , <i>yae</i> (2), <i>beeyae</i>
		C.	<i>yaebe</i> (2)
	ye	R.	<i>Faragiye</i>
	-y	R.	<i>ihy</i> (2), <i>bacy</i> , <i>mangiy</i> , <i>gaimangiy</i> (2), <i>gawaewaay</i> (2), <i>tafeey</i>
IV.....	ee	R.	<i>aetal</i>
	i	R.	<i>ilegihr</i> , <i>ishi</i> (5), <i>ilhagil</i> , <i>tai</i> , <i>Ingeliis</i> (2), <i>ishilh</i> (8), <i>ishilhi</i> (2), <i>itaelhi</i> , <i>iyang</i> , <i>itaelh</i> , <i>iwoengoe</i> , <i>igaelha</i> (3), <i>yaetaetaei</i> , <i>aetai</i> , <i>aetaifilh</i> , <i>gaimangiy</i> , <i>itipaelhi</i> , <i>gaigabungv</i> (2), <i>aetaei</i> , <i>paahi</i> , <i>Ifaelhuug</i>
		C.	<i>ilegihr</i> , <i>ishi</i> , <i>ilhagil</i> , <i>ishilh</i> , <i>paahi</i> , <i>Ifaelhuug</i>
	ih	M.	<i>paahi</i>
		R.	<i>ihy</i> (2), <i>ihsh</i> , <i>ih</i> , <i>ihmw</i>
		C.	<i>ihmw</i>
	ih+a	R.	<i>ihaj</i>
	ih+y	R.	<i>ihy</i> (3)
	uu	R.	<i>uuwe</i> (4)
	v	R.	<i>yaewavriis</i>
	-y	R.	<i>ihwanhaey</i>
		C.	<i>gawaewaay</i>
IV+III.....	ya	M.	<i>Weleeya</i>
	-y	R.	<i>kepatekay</i>
V.....	we	M.	<i>Weleeya</i>
	woah	R.	<i>woalow</i> , <i>woalh</i> (2)
	yoeh	C.	<i>yoch</i>
VI.....	none		
VII.....	fi	R.	<i>fitou</i> (2), <i>gafitaeg</i> (6), <i>yaegafitaeg</i>
	fii	C.	<i>gafitaeg</i>
	-f	R.	<i>aetaifilh</i>
		R.	<i>yaf</i>
		C.	<i>yaf</i>
		M.	<i>yaf</i>
VIII.....	gi	R.	<i>ilhagil</i> , <i>fatogi</i> (7), <i>geragiroegilhi</i> , <i>tiligaelh</i> , <i>roesafatogi</i> , <i>Faragiye</i> , <i>seehgi</i> , <i>gish</i> (5), <i>sifatogi</i> (2)
		C.	<i>ilhagil</i> , <i>fatogi</i> , <i>seehgi</i> , <i>gish</i>
	gih	M.	<i>seehgi</i>
		R.	<i>ilegihr</i>
		C.	<i>ilegihr</i>
	gil	R.	<i>yoahlagiilh</i>
	go	C.	<i>gozvlhi</i>
	-g	R.	<i>gafitaeg</i> (6), <i>masharag</i> (3), <i>yaegafitaeg</i> , <i>Namwoachliq</i>
		C.	<i>gafitaeg</i> , <i>masharag</i>
		M.	<i>Namwoachiig</i>
VIII+III	gl	R.	<i>tirigi</i>
IX.....	nge	R.	<i>Ingelils</i> (2)
	ngi	R.	<i>mangiy</i> , <i>gaimangiy</i> (2)
	-ng	R.	<i>galayalimang</i> , <i>chang</i> , <i>lahng</i> , <i>tahng</i> , <i>cang</i>
		C.	<i>chang</i> , <i>lahng</i> , <i>tahng</i>
		M.	<i>chang</i> , <i>lahng</i>
	-ngh	R.	<i>gabungh</i>

TABLE 3.—*Characters and their actual syllabic values, arranged according to sequence of characters in figures 25 and 26—Continued*

Character No.	Syllables represented by character	Informant	Words in which character is used	
X.....	li	R.	tiligiaelh, limeeg, ngali (2), Galayalimang	
	lih	R. C.	lihmw	
	lbi	R.	raelhi (2), fath-fathvli (4), gozvlhi (5), geragiroegilhi, mwalhi, ngalhi, ulunhvli, lhi (2), kapetalhi, gamwoelhaelhi (3), sitipaelhi, maalhi, itipaelhi, itaelhi	
		C.	raelhi, fath-fathvli, gamwoelhaelhi	
	ri	R.	tirigi (an error?)	
	-l	R.	yaremaataal, kapetal (3), matae-maetael, nhopal	
	-lh	C.	yaremaataal, ilhagil, kapetal	
		R. C.	yoahlagiilh, raelh (5), tiligiaelh, falh, woalh (2), fatilh, tahlh yoahlagiilh, wae-waeth, ishilh, fatilh, tahlh	
	-n	M.	fatilh	
	-nh	R.	lbaen	
X+33.....	lhi	R.	lhaenh (2)	
X+IV.....	lhi	R.	gamwoelhaelhi	
XI.....	mi	R.	ishilhi	
	mi	R.	misilhaelh, misilh, milh	
XII.....	mi	C.	milh	
	mwi	C.	simiilh	
	wih	C.	mwilh	
XIII.....	-e	R.	wihc	
		C.	wihe	
XIII+III.....	shi	R.	wihc	
		O.	wihc	
	shih	R.	ishi (4), ishilh (7), ishilhi (2)	
		C.	ishi, ishilh	
	-sh	R.	shihm	
		O.	shihm	
	shih	R.	baesh	
		O.	baesh	
	XIII+III.....	shi	M.	baesh
		pi	R.	ishi
XIV.....	pih	R.	tapilh, pipi	
		C.	pipi	
XIV+III.....	pi	M.	pipi	
		R.	pihpih	
XIV+III.....	pli	C.	Pihg, pihpih	
		M.	Pihg, pihpih	
XIV+III.....	pl	R.	Yaurwpiig (2)	
		R.	pipi	
XV.....	si	M.	pipi	
		R.	pihpih	
XV.....	-s	R.	sibae (8), sibaegvla (3), siboe, sigal, siya (3), misilh, misi-lhaelh, si (2), sia (3), sifatogi (2), sitipaelhi	
		C.	sibae, simiilh	
	shi	R.	Ingeliis (2), yaewavriis, baes	
		C.	baes	
	sho	R.	ishilh	
		C.	shog	
	XVI.....	-sh	R.	ihsh
		oa	R.	babioarw
	XVI.....	yoa	R.	yoarw
		yoah	R.	yoah, yoahlagiilh
XVI.....	yoeh	R.	yoeh	
	te	R.	Teomal	
XVII.....	ti	R.	tiligiaelh, tirigi, sitipaelhi, itipaelhi, fatilh	
		C.	fatilh	
	tli	M.	fatilh	
		C.	fatilh	
	tv	M.	fatilh	
		C.	fatelh	
	-d	R.	boad, tahd	
		C.	boad, tahd	
	XVIII.....	ri	M.	boad, tahd
			R.	foari (3)
XVIII.....	u	C.	foari	
		M.	foari	
XIX.....	uh	R.	Yaurwpiig (2), toulap (3), ulunhvli, yaetoulap, aetoulap, ung	
		C.	ung, toulap	
XIX.....	w-	R.	uhng	
		C.	uhng	
XIX+14.....	vb	R.	sowg	
		R.	row-row, shvhw	
XIX+39.....	u	R.	phi	
XIX+39.....	u	R.	fitou (2)	

TABLE 3.—*Characters and their actual syllabic values, arranged according to sequence of characters in figures 25_A and 26—Continued*

Character No.	Syllables represented by character	Informant	Words in which character is used
1-----	la	R. C. M. T. R. C. M. R. C. R. R. R. M.	<i>lagoshag, yoahlaglih, toulap</i> (3), <i>sibaegvla</i> (3), <i>aetoulap, yaetoulap, Falaluus, Faetalap, Foeshavlap</i> (2), <i>gvla lagoshag, toulap</i> (2), <i>Foeshavlap, gvla</i>
	lah	R. C. M.	<i>lahng, lahng, lahng</i>
	lha	R.	<i>lgaetha</i> (3)
	lhah	R. C.	<i>lhahng, lhahng, lhahng, lhahng</i>
	lhac	R.	<i>lhaen, lhaenh</i> (2)
	-lh	R.	<i>ishith, kalh</i>
	na	R. M.	<i>Namwoachlig, Namwoachiig</i>
1+III-----	lae	C.	<i>maetae</i>
2-----	go	R. C. M.	<i>lagoshag, gosh, gomw, gozvl, gozvlh, gozvlhi</i> (6) <i>lagoshag, gosh, gomw, gosh</i>
	goa	R. C.	<i>goamw, goamw</i>
	ga+i	R.	<i>gaimangiy</i>
	-g	R. C.	<i>yaelog, Sowg, tog, tohg, tog, tohg</i>
	jo	R. C.	<i>josha, jo-jo</i> (3), <i>josoar, joshos, josha, jo-jo</i>
3-----	-k	R.	<i>buhk</i>
	ta	R. C.	<i>Kapetal</i> (9), <i>tai, eetal, aeta, aetai, kapetalhi, tafee, tafee</i>
	ta+i	C.	<i>tai</i>
	tah	R. C. M.	<i>tahd, tahl, tahlh, tahng, tahng, taht, tahd, tahl, tahlh, tahng, tahng, taht, tahd</i>
	taa	R. C.	<i>yaremaataal, maetaalh</i> (2) <i>yaremaataal</i>
	tae	R.	<i>itaelh, itaelhi, aetael, eetaemwalh, yaetaetaei</i>
4-----	te	R.	<i>kepatekay</i>
	ba	R.	<i>babioarw</i>
	baah	R. C. M.	<i>baahsh, baahsh, baahsh</i>
	bae	R. C. M.	<i>bae</i> (21), <i>baey, baes, baesh</i> (2), <i>eebae, rebae</i> (4), <i>sibae</i> (8), <i>sibaegvla</i> (3) <i>bae, baes, baesh, rebae</i> (4), <i>sibae</i>
	be	R. C.	<i>baesh, yaebe</i> (12), <i>yaebegach, yaebe</i>
4+IV-----	boe	R.	<i>siboe, boegare</i>
5-----	bee	R.	<i>beeyae</i>
	-c	R. C.	<i>mwoac-mwoac, mwoac-mwoac</i>
	-sh	R. C. M.	<i>gosh, gosh, gosh</i>
6-----	la	C.	<i>yoahlagilh</i>
	lo	R.	<i>yaelog, Pulowath</i>
	-n	R. C. M.	<i>bun, bun, bun</i>
	-nh	R. C.	<i>bunh, bunh</i>
6+XIX-----	lo	R.	<i>woalow</i>
7-----	none		
8-----	rw-	R.	<i>Yaurwplig</i> (2)
9-----	none		
10-----	pu	R.	<i>punh</i>
11-----	ma	R.	<i>gaimangiy, Galayalimang</i>
	maa	C.	<i>yaremaataal</i>
	mae	R. C. M.	<i>maetae</i> (7), <i>maetael, maetaeh</i> (2), <i>maetaalh</i> (2), <i>mae</i> (9) <i>mae, maetae</i>
	maeh	R. C.	<i>mae, maeh, maeh</i>
	mwa	R.	<i>mwaelhewe</i>
	-mw	C.	<i>lihmw</i>
11+IV-----	mee	R.	<i>limeeg</i>

TABLE 3.—*Characters and their actual syllabic values, arranged according to sequence of characters in figures 25 and 26—Continued*

Character No.	Syllables represented by character	Informant	Words in which character is used
12.....	nge ngoe -ng	R. R. R. C. M.	<i>nge</i> (7) <i>iwoengoe</i> <i>cang</i> <i>cang, uhng</i> <i>cang</i>
	-ngh	R. C.	<i>tahng</i> <i>tahng</i>
13.....	boa	R. C. M.	<i>boad</i> <i>boad</i> <i>boad</i>
	bu pu wa	R. R. R. C. M.	<i>gabungh</i> <i>Pulowath</i> <i>yaewavriis, yaewal, Pulowath, Sataawal</i> (2) <i>Sataawal</i> <i>Sataawal</i> <i>Sataawal</i>
	wae woa wae	C. R. C.	<i>wae-wae</i> <i>woolow</i> <i>gawacwaay</i>
14+IV.....	wae	R.	<i>masharag</i> (3), <i>rarah</i>
15.....	ra	C. R.	<i>masharag</i> <i>row-row</i>
16.....	ro uu	R. R. C.	<i>uur, uurw</i> <i>uur, uurw</i>
	uuh	R. C.	<i>uuhl</i> <i>uuhl</i>
	v	R. C. M. T.	<i>Foeshavlap</i> (2) <i>Foeshavlap</i> <i>Foeshavlap</i> <i>Foeshavlap</i> (2)
	vh i+-w -y to	C. R. R. R.	<i>vh</i> <i>Woettegaw</i> <i>semwoey</i> (2), <i>seemwoey</i> (2) <i>fatogi</i> (7), <i>toulap</i> (3), <i>aetouiap, yaetoulap, sifatogi</i> (2), <i>roesafatogi, yatowe, fitou</i> (2), <i>tog</i>
17.....	to	C.	<i>fatogi, toulap, tog</i>
	toh	R. C.	<i>toh</i> <i>toh</i>
	-t thv	R. R. C.	<i>maah</i> <i>fath-fathvlhi</i> (4) <i>fath-fathvlhi</i>
	-th	R. C.	<i>fath-fathvlhi</i> (4), <i>fath-fath</i> (2), <i>yaefath, yath, gahth, math</i> <i>fath-fath, gahth, math, fath-fathvlhi</i>
18.....	ca	R. C. M.	<i>cang</i> (2) <i>cang</i> <i>cang</i>
	cha	R. C. M.	<i>chang</i> <i>chang</i> <i>chang</i>
	sha	R. C. M. T.	<i>lagoshag, shag</i> (3), <i>Foeshavlap</i> <i>lagoshag, Foeshavlap, josa</i> <i>Foeshavlap</i> <i>Foeshavlap</i> (2)
19.....	ta mae -m	R. R. R. C.	<i>tapilh</i> <i>maelhael</i> (2) <i>shihm</i> <i>shihm</i>
	mwa mwae mwoc	R. R. R. C.	<i>eetaemwalh</i> <i>mwaelh</i> <i>gamwoelha, mwoelaelh, gamwoelhaelhi</i> (5), <i>yaemwoelh</i> <i>gamwoelhaelhi</i>
	-mw	R. C.	<i>ihmw, lihmw, goamw</i> <i>ihmw, goamw</i>
20.....	chli	R. M.	<i>Namwoachiig</i> <i>Namwoachiig</i>
	-ch sha	R. R. C.	<i>mahch</i> <i>Foeshavlap, masharag</i> (3) <i>masharag</i>
	-sh	R. C. M.	<i>gish</i> (5), <i>yash</i> (12), <i>roehsh, raash, pahngash, baahsh</i> <i>gish, baahsh</i> <i>baahsh</i>
21.....	ma mah maeh mwa	R. M. R. R.	<i>Teomal</i> <i>mahch</i> <i>maeht</i> <i>mwalhi</i>
22.....	ro -rw	R. C. R.	<i>ro-ro</i> <i>ro-ro</i> <i>yoarw, babioarw</i>

TABLE 3.—*Characters and their actual syllabic values, arranged according to sequence of characters in figures 25 and 26—Continued*

Character No.	Syllables represented by character	Informant	Words in which character is used
23.....	ma	R.	<i>masharag</i> (3), <i>matae-maetael</i> , <i>mangiy</i> , <i>galmangly</i> , <i>math</i>
		C.	<i>masharag</i> , <i>math</i>
	mah	R.	<i>mah</i> , <i>mahch</i> , <i>mahlh</i>
		C.	<i>mah</i> , <i>mahlh</i>
	maa	M.	<i>mah</i> , <i>mahlh</i>
		R.	<i>maat</i> , <i>maasvr</i> , <i>maazvr</i> , <i>maahlh</i> , <i>yaremaat</i> , <i>yaremaataal</i>
		C.	<i>maat</i> , <i>maasvr</i> , <i>maazvr</i> , <i>yaremaat</i> (2)
		M.	<i>maat</i>
	maah	R.	<i>maahlh</i> , <i>maeht</i> (2)
		C.	<i>maahlh</i> , <i>maeht</i>
	M.	<i>maahlh</i> , <i>maeht</i>	
	R.	<i>matae-maetael</i>	
	M.	<i>mahch</i>	
	R.	<i>simiilh</i>	
24.....	none		
25.....	ta	R.	<i>aetaifilh</i>
		C.	<i>kapetal</i>
	taa	R.	<i>Sataawal</i> (2)
		C.	<i>Sataawal</i>
		M.	<i>Sataawal</i>
		A.	<i>Sataawal</i>
	tae	R.	<i>gafitaeg</i> (6), <i>yaetaetaei</i> , <i>etae</i> , <i>matae-maetael</i> , <i>yaegafitaeg</i>
		C.	<i>gafitaeg</i>
	tte	R.	<i>Wocttegalw</i>
	tee	R.	<i>kapateeyae</i>
-t	R.	<i>kepat</i> (14), <i>alefahpaet</i> (2), <i>maat</i> , <i>maeht</i> , <i>gepat</i> , <i>taht</i> , <i>faat-faat</i> , <i>yaremaat</i>	
	C.	<i>kepat</i> , <i>maat</i> , <i>maeht</i> , <i>gepat</i> , <i>faat-faat</i> , <i>taht</i> , <i>yaremaat</i> (2)	
	M.	<i>kepat</i> , <i>maat</i> , <i>maeht</i> , <i>gepat</i>	
26.....	-th	R.	<i>Pulowath</i>
	pa	R.	<i>kepatekay</i>
	paē	R.	<i>itipaelhi</i> , <i>sitipaelhi</i>
	pe	R.	<i>kapetal</i> (9), <i>kapetalhl</i>
		C.	<i>kapetal</i> (2)
	-p	R.	<i>toulap</i> (3), <i>aetoulap</i> , <i>yaetoulap</i> , <i>Fagosap</i> , <i>Faelalap</i> , <i>Foeshavlap</i> (2)
		C.	<i>toulap</i> (2), <i>Foeshavlap</i>
		M.	<i>Foeshavlap</i>
		T.	<i>Foeshavlap</i> (2)
		R.	<i>foari</i> (3)
27.....	foa	M.	<i>foari</i>
		R.	<i>foari</i>
28.....	-ch	R.	<i>yaebegach</i> , <i>gach</i>
		M.	<i>mahch</i>
28+16.....	shv	R.	<i>shv</i>
	shvh	C.	<i>shvhv</i>
	shv	C.	<i>shv</i>
29.....	bi	R.	<i>babioarw</i>
	bu	R.	<i>bun</i> , <i>bunh</i>
		C.	<i>bun</i> , <i>bunh</i>
	M.	<i>bun</i>	
	R.	<i>buhk</i>	
30.....	buh		
31.....	none		
	tu	R.	<i>tutu</i>
	R.	<i>tuut</i> , <i>tuutuu</i>	
	C.	<i>tuut</i> , <i>tuutuu</i>	
	C.	<i>tuuh</i>	
	O.	<i>tuuh</i>	
	R.	<i>fatlh</i>	
	R.	<i>tuut</i> , <i>tuuh</i>	
	R.	<i>tuut</i> , <i>tuuh</i>	
	C.	<i>tuut</i> , <i>tuuh</i>	
	C.	<i>tuutuu</i>	
31+16	tuu	C.	<i>tuutuu</i>
	R.	<i>tuuh</i>	
32.....	tuuh	R.	<i>fath-fathvlhi</i> (4), <i>fath-fath</i> (2), <i>fatogi</i> (7), <i>sifatogi</i> (2), <i>roesafatogi</i> , <i>falh</i> (3), <i>yaefath</i> , <i>fatilh</i> , <i>fatvlh</i> , <i>Fagosap</i> , <i>Faragiye</i>
	fa	R.	<i>fath-fathvlhi</i> , <i>fath-fath</i> , <i>fatogl</i> , <i>fatilh</i> , <i>fatilh</i> , <i>fatvlh</i>
		C.	<i>fath-fathvlhi</i> , <i>fath-fath</i> , <i>fatogl</i> , <i>fatilh</i> , <i>fatilh</i> , <i>fatvlh</i>
		M.	<i>fatilh</i> , <i>fatilh</i>
		R.	<i>alefahpaet</i> (2)
	fah	R.	<i>faat-faat</i>
	faa	R.	<i>faat-faat</i>
		C.	<i>faat-faat</i>
	fae	R.	<i>foelvw</i>
	foe	R.	<i>Foeshavlap</i>

TABLE 3.—*Characters and their actual syllabic values, arranged according to sequence of characters in figures 25 and 26—Continued*

Character No.	Syllables represented by character	Informant	Words in which character is used
33.....	la	R.	Galayalmang
	lae	R.	lae, maelae (7), maelael, mwoelaelh
	le	R.	ilegihr, alefahpaet (2)
		C.	ilegihr
	lee	R.	Weleeya (14)
		C.	Weleeya (6)
	lii	R.	Ingeliis (2), galiisorw (2)
	-l	R.	ilhagil, kapetal (6), nhopal (4), eetal, gozvl, sigal, maelhael (2), maelael, yael, yaewal, Sataawal (2), tahl, vhl, Teomal kapetal (2), Sataawal, tahl
		C.	Sataawal
		M.	Sataawal
		A.	Sataawal
	lha	R.	ilhagil, gamwoelha
	lhae	C.	ilhagil
		R.	maelhae (2), jalhae, misilhaelh, maelhael (2), gamwoelhaelhi (5)
		C.	gamwoelhaelhi
	lhe	R.	mwaelhewe
	lhi	R.	gozvhi, lshilhi, gamwoelhaelhi
-lh	R.	raelh (7), ishilh (7), raralh, falh (2), mwaelh, mwoelaelh, cetaemwalh, misilhaelh, misilh, Saepalh, actaifilh, yaemwoelh, maetaalh (2), pangalh (3), itaelh, milh, mwilh, fatvhl	
	C.	simiilh, fatiilh, mlh, mwilh, fatvhl	
	M.	fatiilh	
nhae	R.	lihwanhaey	
nhe	R.	nhopal (5)	
-nh	R.	punh	
33+I.....	lee	M.	Weleeya
33+X.....	lhl	C.	gozvhi
	-lh	R.	raelh
34.....	mae	R.	mae (2)
	mwoa	R.	Namwoachlig, mwoac-mwoae
	mwoe	R.	semwoey (2), seenwoey (2)
	-mw	R.	gomw
35.....	ra	R.	geragiroegilhi, Faragiye
	raa	R.	raash
	rae	R.	raelh (13), raelhi (2), raesorw
		C.	raelh, raelhi
	re	R.	re (5), gare (2), boegare, rebae (4), yaremaat, yaremaataal
		C.	rebae (4), yaremaataal, yaremaat (2)
	rii	R.	yaewavriis
	roe	R.	geragiroegilhi, roesafatogi
	roeh	R.	roeksh
	-r	R.	ilegihr, yar, ihr, uur
		C.	ilegihr, uur
	-rw	C.	uurw
36.....	lih	R.	lihwanhaey
	luu	R.	Falalus
	lv	R.	faelvw (2)
	-l	R.	uuhl
		C.	uuhl, vhl
	lhuu	R.	Ifaelhuug
		C.	Ifaelhuug
	-lh	R.	simiilh, mahlh, maahlh
		C.	mahlh, maahlh
		M.	mahlh, maahlh
37.....	-nh	C.	punh
	ca	R.	cangh
	sa	R.	roesafatogi, Fagosap, Sataawal (2)
		C.	Sataawal
		M.	Sataawal
		A.	Sataawal
	sah	R.	sahg
	sae	R.	Saepalh
	sha	R.	shag, josa
38.....	toe	R.	toetoe
		C.	toetoe
39.....	o	R.	Teomal
	wa	R.	lihwanhaey
	waa	R.	gawaewaay (2)
		C.	gawaewaay
	wae	R.	wae-wae, wae-waelh, gawaewaay (2)
		C.	wae-waelh
	we	R.	Weleeya (14), yatowe, uuwe (4), mwaelhewe
		C.	Weleeya (6)
	woe	R.	ivoengoe, Woettegaiw
	-w	R.	seeaw (6), seeow, woalow (2), faelvw (2)
		C.	shvhw

TABLE 3.—*Characters and their actual syllabic values, arranged according to sequence of characters in figures 25 and 26—Continued*

Character No.	Syllables represented by character	Informant	Words in which character is used
40-----	se	R.	<i>semwoey</i> (2)
	see	R.	<i>seemwoey</i> (2)
	see+a	R.	<i>seeaw</i> (6)
	see+o	R.	<i>seeov</i>
	si	R.	<i>similih</i>
	shvh	R.	<i>shvhw</i>
	-sh	R.	<i>baesh, yash</i>
	-t	R.	<i>maehi</i> (an error?)
40+IV-----	see	R.	<i>seeg</i>
		C.	<i>seeg</i>
		M.	<i>seeg</i>
	seeh	R.	<i>seehgl</i>
		C.	<i>seehgl</i>
		M.	<i>seehgl</i>
41-----	gv	R.	<i>gvlā, sibaegvlā</i> (3)
	-g	R.	<i>shag</i> (4), <i>shog</i> (5), <i>lagoshag, sahg, Ifaelhuug</i>
		C.	<i>lagoshag, Ifaelhuug</i>
42-----	so	R.	<i>sowg</i>
	zv	R.	<i>gozvl, gozvlh, gozvlhi</i> (6)
43-----	pa	R.	<i>kepat</i> (14), <i>nhopal</i> (5), <i>kapateeyae, Saepalh, pangalh</i> (3), <i>gepat</i>
		C.	<i>kepat, gepat</i>
		M.	<i>kepat, gepat</i>
	pah	R.	<i>pahngash</i>
	paah	R.	<i>paahl</i>
		C.	<i>paahi</i>
		M.	<i>paahi</i>
		C.	<i>kapetal</i>
44-----	pe		
	none		
45-----	sho	R.	<i>shog</i> (5)
46-----	ga	R.	<i>gare, gafitaeg</i> (6), <i>gamwoelha, sigal, yaebegach, gabungh</i> (2), <i>gamwoelhaelhi</i> (5), <i>galmangiy, gawaewaay</i> (2), <i>boega_re,</i> <i>gach, gaigabungv</i> (2), <i>Woettegalw, Galayalimang, yaega_re,</i> <i>taeg, galiisorw</i> (2)
	gah	R.	<i>gahth</i>
		C.	<i>gahth</i>
	ja	R.	<i>jalhae</i>
	-j	R.	<i>ihaj</i>
	ka	R.	<i>kapetal</i> (9), <i>kapetalhi, kepatekay, ka</i> (5)
		C.	<i>kapetal</i> (2)
	ke	R.	<i>kepatekay</i>
	kee+l	R.	<i>keei</i>
		C.	<i>keei</i>
47-----	-r	R.	<i>maasvr, maazvr, josoar</i>
		C.	<i>maasvr, maazvr</i>
	-rw	R.	<i>sorw</i> (2), <i>galiisorw</i> (2), <i>raesorw, uurw</i>
	-s	R.	<i>joshos</i> (an error?)
47+39+IV-----	rwee	R.	<i>rweeg</i> (2)
48-----	nga	R.	<i>ngali</i> (2), <i>ngalhi, pangalh</i> (3), <i>pahngash</i>
49-----	mwoa	C.	<i>mwoac-mwoac</i>
		M.	<i>Namwoachiig</i>
	-mw	C.	<i>gomw</i>
50-----	ga	R.	<i>gare, gaigabungv</i> (2)
		C.	<i>gawaewaay</i>
	gae	R.	<i>igaelha</i> (3)
	ge	R.	<i>geragiroegllhi, gepat</i>
		C.	<i>gepat</i>
		M.	<i>gepat</i>
	-g	R.	<i>limeeg, rweeg</i> (2), <i>Yaurwpiig</i> (2), <i>seeg</i>
		C.	<i>seeg, Pihg</i>
		M.	<i>seeg, Pihg</i>
	ka	R.	<i>kahl, kapateeyae</i>
		C.	<i>kapetal</i>
	ke	R.	<i>kepat</i> (14)
		C.	<i>kepat</i>
		M.	<i>kepat</i>
50+IV-----	kee	R.	<i>keei</i>
51-----	tu	C.	<i>tutu</i>
52-----	-ng	R.	<i>lhahng, ung, uhng</i>
		C.	<i>lhahng, ung</i>
	-ngh	R.	<i>lhahng, cangh</i>
		C.	<i>lhahng</i>
		C.	<i>foari</i>
53-----	foa	C.	<i>foari</i>
54-----	none		
55-----	none		
56+IV-----	go	R.	<i>Fagosap</i>
57-----	none		
58-----	ngv	R.	<i>gaigabungv</i> (2)
	-ngh	R.	<i>gabungh</i>

TABLE 3.—*Characters and their actual syllabic values, arranged according to sequence of characters in figures 25 and 26—Continued*

Character No.	Syllables represented by character	Informant	Words in which character is used
59.....	bu	R.	gaigabungv (2), gabungh
	pu	C.	punh
60.....	to+u	C.	toulap
61.....	none		
62.....	sv	R.	maazv
		O.	maazv
	-s	R.	Falaluus
	zv	R.	maazv
		O.	maazv
63.....	none		
64.....	none		
65.....	lo	R.	woalow
	lu	R.	ulunhvlhi
	nhv	R.	ulunhelhi
66.....	fa	R.	Falaluus
	fae	R.	faelvw, Faelalap, Ifaelhuug
		C.	Ifaelhuug
	fee	R.	tafee
	foe	R.	Foeshavlap
		C.	Foeshavlap
		M.	Foeshavlap
		T.	Foeshavlap (2)
	-f	R.	yahf
		C.	yahf
		M.	yahf
66+III.....	pae	R.	alefahpaet (2) (an error?)
	fee	R.	tafee
67.....	mw1	R.	mwilh
68.....	so	R.	sorw (2), galiisorw (2), raesorw
	soa	R.	josoar
	sho	R.	joshos
69.....	none		
70.....	none		
71.....	none		
72.....	none		
73.....	none		
74.....	ga	C.	gare, gafitaeg, gamwoelhaelhi
	gv	C.	gvla
75.....	none		
76.....	none		
77.....	none		
78.....	none		

TABLE 4.—Syllables and the characters used for them, arranged according to the phonemic sequence of table 1

[Numbers in parentheses following a character designation indicate number of times, when more than once, that character is used, by each informant, to write the italicized syllable of the word preceding in the second column. Plus signs: in the first column plus signs indicate when two syllables are written with a single character; in the columns under informant designations they indicate when two characters are used to represent a single syllable. Informant designations: R.=Marollgar; C.=Chiyemal; M.=Magilo; T.=Tachep; A.=Marutang.]

Syllables	Words in which syllables occur	Character used by—				
		R.	C.	M.	T.	A.
a.....	<i>sla</i>	I (3)				
ae.....	<i>alefahpaet</i>	I (2)				
	<i>tiligiaelh</i>	III				
	<i>aetoulap</i>	III				
	<i>aetai</i>	III				
	<i>aeta</i>	III				
	<i>aetaifilh</i>	III				
	<i>aetaei</i>	III				
ee.....	<i>etae</i>	III				
	<i>etaemwalh</i>	III				
	<i>eebae</i>	III				
	<i>etal</i>	IV				
i.....	<i>ilegihr</i>	IV	IV			
	<i>ishi</i>	IV (5)	IV			
	<i>ilhagil</i>	IV	IV			
	<i>tai</i>	IV				
	<i>Ingellis</i>	IV (2)				
	<i>ishilh</i>	IV (8)	IV			
	<i>ishilhi</i>	IV (2)				
	<i>itaelhi</i>	IV				
	<i>iyang</i>	IV				
	<i>itaelh</i>	IV				
	<i>ivoengoe</i>	IV				
	<i>igaelha</i>	IV (3)				
	<i>yaetaetaei</i>	IV				
	<i>aetai</i>	IV				
	<i>aetaifilh</i>	IV				
	<i>gaimangiy</i>	IV				
	<i>itipaelhi</i>	IV				
	<i>gaigabungv</i>	IV (2)				
	<i>aetaei</i>	IV				
	<i>paahi</i>	IV	IV	IV		
	<i>Ifaelhuug</i>	IV	IV			
	<i>keei</i>	III				
i+-w.....	<i>Woettegaiw</i>	16				
ih.....	<i>ihy</i>	IV (2)				
	<i>ihsh</i>	IV				
	<i>ihr</i>	IV				
	<i>ihmw</i>	IV	IV			
ih+a.....	<i>ihaj</i>	IV				
ih+y.....	<i>ihy</i>	IV (3)				
o.....	<i>Teomal</i>	39				
oa.....	<i>babioarw</i>	XVI				
u.....	<i>Yaurwpiig</i>	XIX (2)				
	<i>toulap</i>	XIX (3)	XIX			
	<i>ulunhvlhl</i>	XIX				
	<i>yaetoulap</i>	XIX				
	<i>aetoulap</i>	XIX				
	<i>ung</i>	XIX	XIX			
	<i>fitou</i>	XIX+39 (2)				
uh.....	<i>uhng</i>	XIX	XIX			
uu.....	<i>uuwe</i>	IV (4)				
	<i>uur</i>	16	16			
	<i>uurw</i>	16	16			
	<i>uuhl</i>	16	16			
uuh.....	<i>uuhl</i>	16	16			
v.....	<i>yaewavriis</i>	IV				
	<i>Foeshaelap</i>	16 (2)	16	16	16 (2)	
	<i>vl</i>	XIX+14	16			
vh	<i>vl</i>	XIX+14	16			
ba.....	<i>babioarw</i>	4				
baah.....	<i>baahsh</i>	4	4	4		
bae	<i>rebae</i>	4 (4)	4 (4)			
	<i>sibae</i>	4 (8)	4			
	<i>bae</i>	4 (21)	4			
	<i>baey</i>	4				
	<i>baes</i>	4	4			
	<i>baesh</i>	4 (2)	4	4		
	<i>eebae</i>	4				
	<i>sibaegvla</i>	4 (3)				
be.....	<i>yaebe</i>	4 (11)	4 (2)			
	<i>yaebegach</i>	4				

TABLE 4.—Syllables and the characters used for them, arranged according to the phonemic sequence of table 1—Continued

Syllables	Words in which syllables occur	Character used by—				
		R.	C.	M.	T.	A.
bee-----	<i>beeyae</i>	4+IV				
bl-----	<i>babioarw</i>	29				
boa-----	<i>boad</i>	13	13	13		
bce-----	<i>siboe</i>	4				
	<i>boegare</i>	4				
bu-----	<i>bun</i>	29	29	29		
	<i>bunh</i>	29	29			
	<i>gabungh</i>	13, 59				
	<i>gaigabungv</i>	59 (2)				
buh-----	<i>buhk</i>	29				
ca-----	<i>cang</i>	18 (2)	18	18		
	<i>cangh</i>	37				
-c-----	<i>wihc</i>	XIII	XIII			
	<i>mwoac-mwoac</i>	5-5	5-5			
cha-----	<i>chang</i>	18	18	18		
chii-----	<i>Namwoachiig</i>	20		20		
-ch-----	<i>yaebegach</i>	28				
	<i>gach</i>	28				
	<i>mahch</i>	20		28		
-d-----	<i>boad</i>	XVII	XVII	XVII		
	<i>tahd</i>	XVII	XVII	XVII		
fa-----	<i>falh</i>	32 (3)				
	<i>fatvlh</i>	32	32			
	<i>fatllh</i>	32	32	32		
	<i>fatilhl</i>	32	32	32		
	<i>fath-fath</i>	32-32 (2)	32-32			
	<i>fath-fathvlihi</i>	32-32 (4)	32-32			
	<i>fatogi</i>	32 (7)	32			
	<i>roesafatogi</i>	32				
	<i>sifatogi</i>	32 (2)				
	<i>yacfath</i>	32				
	<i>Fagosap</i>	32				
	<i>Faraglyc</i>	32				
	<i>Falaluis</i>	66				
fah-----	<i>alefahpaet</i>	32 (2)				
faa-----	<i>faat-faat</i>	32-32	32-32			
fae-----	<i>faelvw</i>	32, 66				
	<i>Faelalap</i>	66				
	<i>Ifaelhuug</i>	66	66			
fee-----	<i>tafee</i>	66+III				
	<i>tafecy</i>	66				
fi-----	<i>gafitaeg</i>	VII (6)	VII			
	<i>fitou</i>	VII (2)				
	<i>yaegafitaeg</i>	VII				
fil-----	<i>aetaifilhl</i>	VII				
foa-----	<i>foari</i>	27 (3)	53	27		
foe-----	<i>Foeshavlap</i>	32, 66	66	66		66 (2)
-f-----	<i>yaf</i>	VII	VII	VII		
	<i>yahf</i>	66	66	66		
ga-----	<i>gare</i>	46, 50	74			
	<i>gafitaeg</i>	46 (6)	74			
	<i>boegare</i>	46				
	<i>yaegafitaeg</i>	46				
	<i>gach</i>	46				
	<i>gallisorw</i>	46 (2)				
	<i>yaebegach</i>	46				
	<i>gabungh</i>	46 (2)				
	<i>gaimangiy</i>	46				
	<i>gamwoelha</i>	46				
	<i>gamwoelhaelhi</i>	46 (5)	74			
	<i>slgal</i>	46				
	<i>gawaewaay</i>	46 (2)	50			
	<i>gaigabungv</i>	46-50 (2)				
	<i>Woettegaiw</i>	46				
	<i>Galayalimang</i>	46				
ga+l-----	<i>gaimangiy</i>	2				
gah-----	<i>gahth</i>	46	46			
gae-----	<i>igaelha</i>	50 (3)				
ge-----	<i>geragiroegilhl</i>	50				
	<i>gepat</i>	50	50	50		
gl-----	<i>seehgi</i>	VIII	VIII	VIII		
	<i>ilhagil</i>	VIII	VIII	VIII		
	<i>fatogi</i>	VIII (7)	VIII			
	<i>sifatogi</i>	VIII (2)				
	<i>roesafatogi</i>	VIII				
	<i>tiligtaelh</i>	VIII				
	<i>gish</i>	VIII (5)	VIII			

TABLE 4.—Syllables and the characters used for them, arranged according to the phonemic sequence of table 1—Continued

Syllables	Words in which syllables occur	Character used by—				
		R.	C.	M.	T.	A.
gi—Con.	geragiroegilhi tirigi Faragiye	VIII-VIII VIII+III VIII				
gih.....	ilegihr	VIII	VIII			
gii.....	yoahlagiilh	VIII				
go.....	lagoshag	2				
	gosh	2		2		
	gomw	2		2		
	gozvl	2				
	gozvlh	2				
	gozvlhi	2 (6)	VIII			
	Fagosap	56+IV				
goa.....	goamw	2	2			
gv.....	sibaegvla	41 (3)				
	gvla	41	74			
-g.....	gafitaeg	VIII (6)	VIII			
	masharag	VIII (3)	VIII			
	yaegafitaeg	VIII				
	Namwoachiig	VIII		VIII		
	yaclog	2				
	Sowg	2				
	tog	2	2			
	tohg	2	2			
	lagoshag	41	41			
	shag	41 (4)				
	shog	41 (5)				
	sahg	41				
	Ifaelhuug	41	41			
	limeeg	50				
	rweeg	50 (2)				
	seeg	50	50	50		
	Pihg	50	50	50		
	Yaurwpiig	50 (2)				
ja.....	jalhae	46				
jo.....	jo-jo	2-2 (3)	2-2			
	josoar	2				
	joshos	2				
	josha	2	2			
-j.....	ihaj	46				
ka.....	ka	46 (5)				
	kepatekay	46				
	kapetalhi	46				
	kapetal	46 (9)	46 (2), 50			
	kalh	50				
	kapateeyae	50				
ke.....	kepat	50 (14)	50	50		
	kepatekay	46				
kee	keei	50+IV				
kee+i	keei		46			
-k.....	buhk	2				
la.....	toulap	1 (3)	1 (2)			
	aetoulap	1				
	yaetoulap	1				
	lagoshag	1	1			
	yoahlagiilh	1	6			
	gvla	1	1			
	sibaegvla	1 (3)				
	Falaluus	1				
	Foeshavlap	1 (2)	1	1		1 (2)
	Faetalap	1/1				
	Galayalimang	33				
lah	lahng	1	1	1		
lae.....	lae	33				
	maelae	33 (7)	1+III			
	maelael	33				
	mwoelaelh	33				
le	ilegihr	33	33			
	alefahpaet	33 (2)				
lee.....	Weleeya	33 (14)	33 (6)	33+I		
li.....	tiligiaelh	X				
	limeeg	X				
	ngali	X (2)				
	Galayalimang	X				
lih.....	lihmw	X	X			
	lihwanhaey	36				
lii.....	Inge <i>liis</i>	33 (2)				
	galiisow	33 (2)				

TABLE 4.—Syllables and the characters used for them, arranged according to the phonemic sequence of table 1—Continued

Syllables	Words in which syllables occur	Character used by—				
		R.	C.	M.	T.	A.
lo.....	yaelog	6				
	woalow	6+XIX, 65				
	Pulowath	6				
lu.....	ulunhvli	65				
luu.....	Falaluus	36				
lv.....	faelw	36 (2)				
-l.....	eetal	33				
	gozvl	33				
	sigal	33				
	maelhael	33 (2)				
	maelael	33				
	yael	33				
	yaewal	33				
	tahl	33	33			
	Teomal	33				
	ilhagil	33	X			
	nhopal	33 (4), X				
	Sataawal	33 (2)		33		
	kapetal	33 (6), X (3)		33 (2), X		33
	yaremaataal	X		X		
	vhl	33		36		
	uuhl	36		36		
	matae-maetaal	X				
lha.....	lhagil	33	33			
	gamwoelha	33				
	igaelha	1 (3)				
lhah.....	lhahng	1	1			
	lhahng	1	1			
lhae.....	lhaen	1				
	lhaenh	1 (2)				
	jalhae	33				
	maelhae	33 (2)				
	maelhael	33 (2)				
	misilhaelh	33				
	gamwoelhaelhi	33 (5)	33			
lhe.....	mwaelhewe	33				
lhi.....	gozvlhi	33, X (5)	33+X			
	ishilhi	33, X+IV				
	gamwoelhaelhi	33, X+33, X (3)	X			
	raelhi	X (2)	X			
	fath-fathvli	X (4)	X			
	geragiroegilhi	X				
	mwalhi	X				
	ngalhi	X				
	ulunhvli	X				
	lhi	X (2)				
	kapetalhi	X				
	maalhi	X				
	itaelhi	X				
	itipaelhi	X				
	sitipaelhi	X				
lhuu.....	Ifaethuug	36	36			
-lh.....	yoahlagiilh	X	X			
	wae-waelh		X			
	raelh	X (5), 33 (7), 33+X				
	woalh	X (2)				
	tahlh	X	X			
	fatilh	X	X		X	
	falh	X, 33 (2)				
	tilligaelh	X				
	ishilh	33 (7), 1	X			
	rarah	33				
	mwaelh	33				
	mwoelaelh	33				
	eetaemwalh	33				
	misilhaelh	33				
	misilh	33				
	Saepalh	33				
	aetaifilh	33				
	yaemwoelh	33				
	maetaalh	33 (2)				
	pangalh	33 (3)				
	itaelh	33				
	fatiilh		33		33	
	milh	33	33			

TABLE 4.—Syllables and the characters used for them, arranged according to the phonemic sequence of table 1—Continued

Syllables	Words in which syllables occur	Character used by—				
		R.	C.	M.	T.	A.
-lh—Con.	<i>mwilh</i>	33	33			
	<i>fatvhl</i>	33	33			
	<i>simililh</i>	36	33			
	<i>mahlh</i>	36	36	36		
	<i>maahlh</i>	36	36	36		
ma-----	<i>kalh</i>	1				
	<i>math</i>	23	23			
	<i>masharag</i>	23 (3)	23			
	<i>matae-maetael</i>	23				
	<i>mangiy</i>	23				
	<i>gaimangiy</i>	23, 11				
	<i>Galayalimang</i>	11				
mah-----	<i>Teomal</i>	21				
	<i>mah</i>	23	23	23		
	<i>mahlh</i>	23	23	23		
maa-----	<i>mahlh</i>	23		21		
	<i>maat</i>	23	23	23		
maah-----	<i>maasvr</i>	23	23			
	<i>maazvr</i>	23	23			
	<i>maalhi</i>	23				
	<i>yaremaat</i>	23	23 (2)			
	<i>yaremaataal</i>	23	11			
	<i>maahlh</i>	23	23	23		
	<i>maeht</i>	23 (2)	23	23		
mae-----	<i>maelae</i>	11 (7)	11			
	<i>maelhae</i>	11 (2)				
	<i>maelael</i>	11				
	<i>maetaalh</i>	11 (2)				
	<i>mae</i>	11 (9), 34 (2)	11	11		
	<i>maelhael</i>	19 (2)				
	<i>matae-maetael</i>	23				
maeh-----	<i>maeh</i>	11	11	23		
	<i>maeht</i>	21				
mee-----	<i>limeeg</i>	11+IV				
ml-----	<i>milh</i>	XI	XI			
	<i>misilh</i>	XI				
	<i>misilhaelh</i>	XI				
mil-----	<i>simililh</i>	23	XI			
-m-----	<i>shihm</i>	19	19			
mwa-----	<i>mwalhi</i>	21				
	<i>eetaemwalh</i>	19				
	<i>mwaelh</i>	19				
mwae-----	<i>mwaelhewe</i>	11				
	<i>mwilh</i>	67	XI			
mwoa-----	<i>mwoac-mwoac</i>	34-34	49-49			
	<i>Namwoachiig</i>	34		40		
mwoe-----	<i>semwoey</i>	34 (2)				
	<i>seemwoey</i>	34 (2)				
	<i>gamwoelha</i>	19				
	<i>gamwoelhaelh</i>	19 (5)	19			
	<i>mwoelaelh</i>	19				
	<i>yaemwoelh</i>	19				
	<i>ihmw</i>	19	19			
-mw-----	<i>lihmw</i>	19	11			
	<i>goamw</i>	19	19			
	<i>gomw</i>	34	49			
	<i>Namwoachiig</i>	1		1		
-n-----	<i>lhaen</i>	X				
	<i>bun</i>	6	6	6		
nhae-----	<i>lhwanhaey</i>	33				
nhe-----	<i>nhopal</i>	33 (5)				
nhv-----	<i>ulunholhi</i>	65				
-nh-----	<i>lhaenh</i>	X (2)				
	<i>bunh</i>	6	6			
	<i>punh</i>	33	36			
nga-----	<i>ngal</i>	48 (2)				
	<i>ngalhi</i>	48				
	<i>pangalh</i>	48 (3)				
	<i>pahngash</i>	48				
nge-----	<i>nge</i>	12 (7)				
ngl-----	<i>Ingelliis</i>	IX (2)				
	<i>mangiy</i>	IX				
ngoe-----	<i>gaimangiy</i>	IX (2)				
	<i>iwoengoe</i>	12				
ngv-----	<i>gaigabungv</i>	58 (2)				

TABLE 4.—Syllables and the characters used for them, arranged according to the phonemic sequence of table 1—Continued

Syllables	Words in which syllables occur	Character used by—				
		R.	C.	M.	T.	A.
-ng-----	<i>cang</i>	12, IX	12	12		
	<i>galayalimang</i>	IX				
	<i>chang</i>	IX	IX	IX		
	<i>lahng</i>	IX	IX	IX		
	<i>tahng</i>	IX	IX			
	<i>lhahng</i>	52	52			
	<i>ung</i>	52	52			
	<i>uhng</i>	52	12			
-ngh-----	<i>tahngh</i>	12	12			
	<i>cangh</i>	52				
	<i>lhahngh</i>	52	52			
	<i>gabungh</i>	58, IX				
pa-----	<i>kepat</i>	43 (14)	43	43		
	<i>gepat</i>	43	43	43		
	<i>nhepal</i>	43 (5)				
	<i>pangalh</i>	43 (3)				
	<i>Saepalh</i>	43				
	<i>kapateeyae</i>	43				
	<i>kepatekay</i>	26				
pah-----	<i>pahngash</i>	43				
paah-----	<i>paahi</i>	43	43	43		
pae-----	<i>sitipaelhi</i>	26				
	<i>itipaelhi</i>	26				
	<i>alefahpaet</i>	66 (2) (error?)				
pe-----	<i>kapetal</i>	26 (9)	26 (2), 43			
	<i>kapetalhi</i>	26				
pi-----	<i>tapilh</i>	XIV				
	<i>pipi</i>	XIV/XIV+III	XIV/XIV	XIV/XIV+III		
pih-----	<i>Pihg</i>	XIV	XIV	XIV		
	<i>pihpih</i>	XIV/XIV+III	XIV/XIV	XIV/XIV		
pii-----	<i>Yaurwpiig</i>	XIV (2)				
pu-----	<i>Pulowath</i>	13				
	<i>punh</i>	10	59			
-p-----	<i>toulap</i>	26 (3)	26 (2)			
	<i>aetoulap</i>	26				
	<i>yaetoulap</i>	26				
	<i>Fagosap</i>	26				
	<i>Faelalap</i>	26				
	<i>Foeshavlap</i>	26 (2)	26	26		
ra-----	<i>masharag</i>	15 (3)	15		26 (2)	
	<i>raralh</i>	15/15				
	<i>geragiroegilhi</i>	35				
	<i>Faragiye</i>	35				
raa-----	<i>raash</i>	35				
rae-----	<i>raesorw</i>	35				
	<i>raelh</i>	35 (13)	35			
	<i>raelhi</i>	35 (2)	35			
re-----	<i>re</i>	35 (5)				
	<i>rebae</i>	35 (4)	35 (4)			
	<i>gare</i>	35 (2)				
	<i>boegare</i>	35				
	<i>yaremaat</i>	35	35 (2)			
	<i>yaremaataal</i>	35	35			
ri-----	<i>foari</i>	XVIII (3)	XVIII	XVIII		
	<i>tirigi</i>	X (error?)				
ril-----	<i>yaewavriis</i>	35				
ro-----	<i>ro-ro</i>	22-22	22-22			
	<i>row-row</i>	15-15				
roe-----	<i>geragiroegilhi</i>	35				
	<i>roesafatogi</i>	35				
roeh-----	<i>roesh</i>	35				
-r-----	<i>yar</i>	35				
	<i>ihr</i>	35				
	<i>ilegihr</i>	35	35			
	<i>uur</i>	35	35			
	<i>josoar</i>	47				
	<i>maasvr</i>	47	47			
	<i>maazvr</i>	47	47			
rw-----	<i>Yaurwpiig</i>	8 (2)				
rwee-----	<i>rweeg</i>	47+39+IV (2)				
-rw-----	<i>babioarw</i>	22				
	<i>yoarw</i>	22				
	<i>uurw</i>	47	35			
	<i>sorw</i>	47 (2)				
	<i>galiisorw</i>	47 (2)				
	<i>raesorw</i>	47				

TABLE 4.—Syllables and the characters used for them, arranged according to the phonemic sequence of table 1—Continued

Syllables	Words in which syllables occur	Character used by—				
		R.	C.	M.	T.	A.
sa.....	roesafatogi	37				
	Fagosap	37				
	Sataawal	37 (2)	37	37		37
sah.....	sahg	37				
sac.....	Sacpah	37				
se.....	semwoey	40 (2)				
see.....	seemwoey	40 (2)				
	seeg	40+IV	40+IV	40+IV		
see+a.....	seeaw	40 (6)				
see+o.....	seeow	40				
sech.....	seehgi	40+IV	40+IV	40+IV		
si.....	sibae	XV (8)	XV			
	siboe	XV				
	si	XV (2)				
	sia	XV (3)				
	siya	XV (3)				
	sibaegvla	XV (3)				
	sigal	XV				
	sifatogi	XV (2)				
	sitipaelhi	XV				
	misilh	XV				
	misilhaelh	XV				
	simiilh	40	XV			
so.....	Sowg	42				
	sorw	68 (2)				
	raesorw	68				
	galiisorw	68 (2)				
soa.....	josoar	68				
sv.....	maasvr	62	62			
-s.....	Ingeliis	XV (2)				
	yaewavriis	XV				
	baes	XV	XV			
	Falaluns	62				
	joshos	47 (error?)				
sha.....	lagoshag	18	18			
	shag	18 (3), 37				
	Foeshavlap	18, 20	18	18	18 (2)	
	masharag	20 (3)	20			
	josha	37	18			
shi.....	ishī	XIII (4), XIII+III	XIII			
	ishilh	XIII (7), XV	XIII			
	ishilhi	XIII (2)	XIII			
shih.....	shihm	XIII	XIII			
sho.....	shog	45 (5)	XV			
	joshos	68				
shv.....	shv	28	28+16			
shvh.....	shvhw	40	28			
-sh.....	gish	20 (5)	20			
	roehsh	20				
	raash	20				
	pahngash	20				
	yash	20 (12), 40				
	baahsh	20	20	20		
	baesh	XIII, 40	XIII	XIII		
	gosh	5	5	5		
	ihsh	XV				
ta.....	kapetal	3 (9)	3 (2), 25			
	tal	3				
	aetal	3				
	aeta	3				
	ectal	3				
	kapetalhi	3				
	tafee	3				
	tafeey	3				
	tapilh	18				
	actoiifilh	25				
ta+i.....	tai		3			
tah.....	tahd	3	3	3		
	tahl	3	3			
	tah̄t	3	3			
	tahlh	3	3			
	tahng	3	3			
	tahnḡh	3	3			
taa.....	yaremaataal	3	3			
	maetaalh	3 (2)				
	Sataawai	25 (2)	25	25		25

TABLE 4.—Syllables and the characters used for them, arranged according to the phonemic sequence of table 1—Continued

Syllables	Words in which syllables occur	Character used by—				
		R.	C.	M.	T.	A.
tae	eetaemwalh	3				
	itaelhi	3				
	aetaei	3				
	itaelh	3				
	yaetaetaei	25/3				
	matae-maetael	25-25				
	eetae	25				
	gafitaeg	25 (6)	25			
	yaegafitaeg	25				
	te	kepatekay	3			
Woettegaiw		25				
Teomal		XVII				
tee	kapateeyae	25				
	tl	tiliglaelh	XVII			
tirigi		XVII				
sitipaelhi		XVII				
itipaelhi		XVII				
fatiilh		XVII	XVII	XVII		
fatiilh			XVII	XVII		
toulap		17 (3)	17			
to	aetoulap	17				
	yaetoulap	17				
	fatogi	17 (7)	17			
	slfatogl	17 (2)				
	roesafatogi	17				
	yatowe	17				
	fitou	17 (2)				
	tog	17	17			
	toulap		60			
	tohg	17	17			
	toetoe	38/38	38/38			
	tutu	31/31	51/51			
	tuut	31	31			
	tuutuu	31/31	31+16/31			
tuuh	tuuht	31+16	31			
	fatvhl	31	XVII			
tv	kepat	25 (14)	25	25		
	gepat	25	25	25		
	alefahpaet	25 (2)				
	yaremaat	25	25 (2)			
	taht	25	25			
	faat-faat	25-25	25-25			
	maat	25	25	25		
	maeht	25, 17	25	25		
	tuut	31	31			
	tuuht	31	31			
	maeht	40 (error?)				
	fath-fathvhl	17 (4)	17			
	fath-fathvhl	17 (4)	17			
	fath-fath	17-17 (2)	17-17			
	yaefath	17				
gahth	17	17				
math	17	17				
yath	17					
zv	Pulowath	25	62			
	maazor	62				
	gozvl	42				
	gozvlhi	42 (6)				
w-	gozvlh	42				
	Sowg	XIX				
wa	yaewavriis	14				
	yaeral	14				
	Pulowath	14				
	Sataawal	14 (2)	14	14		
	lihwanhaey	39			14	
waa	gawaewaay	39 (2)	39			
	wae-wae	39-39	14-missing			
wae	wae-waelh	39-39	39-39			
	gawaewaay	39 (2)	14+IV			
	Weleeya	39 (14)	39 (6)	V		
we	yatowe	39				
	uuwe	39 (4)				
wih	mwaelhewe	39				
	wihc	XII	XII			
woa	woalh	V (2)				
	woalow	V, 14				

TABLE 4.—Syllables and the characters used for them, arranged according to the phonemic sequence of table 1—Continued

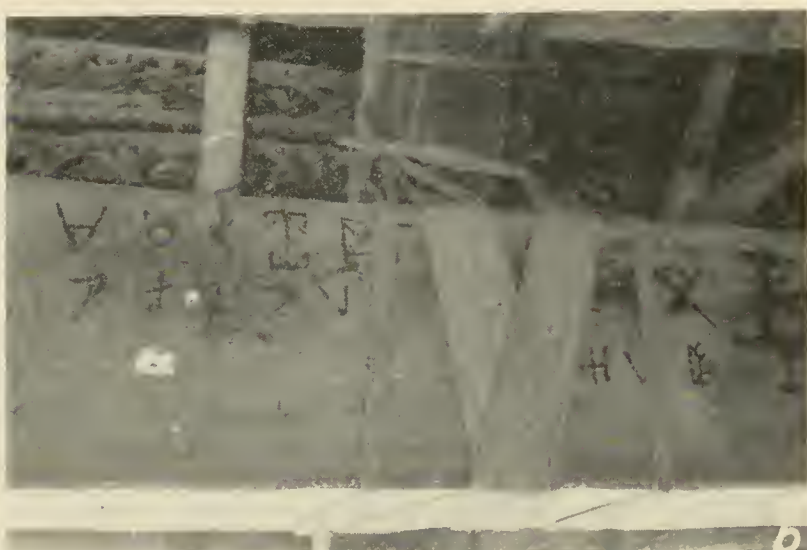
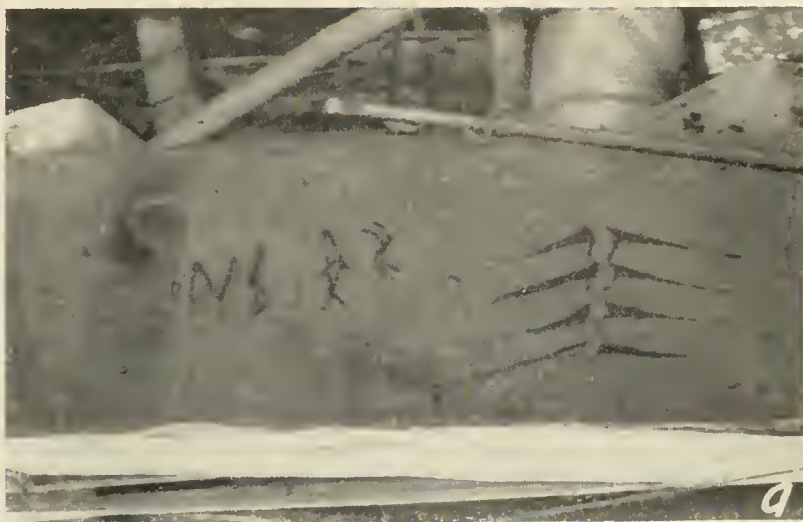
Syllables	Words in which syllables occur	Character used by—				
		R.	C.	M.	T.	A.
woe.....	<i>iwoengoe</i>	39				
	<i>Woettegaiw</i>	39				
-w.....	<i>seeaw</i>	39 (6)				
	<i>seeow</i>	39				
	<i>walow</i>	39 (2)				
	<i>faelw</i>	39 (2)				
	<i>shvw</i>	XIX	39			
	<i>row-row</i>	XIX-XIX				
ya.....	<i>yar</i>	I				
	<i>yath</i>	I				
	<i>yaf</i>	I	I	I		
	<i>yaremaat</i>	I	I (2)			
	<i>yaremaatal</i>	I	I			
	<i>yash</i>	I (13)				
	<i>yatowe</i>	I				
	<i>iyang</i>	I				
	<i>siya</i>	I (3)				
	<i>Galayallmang</i>	I				
	<i>Yaurwpiig</i>	I, III				
	<i>Weleeya</i>	I (14)	I (6)	IV+III		
yah.....	<i>yahf</i>	I	I	I		
yae.....	<i>yae</i>	III (2)				
	<i>yaebe</i>	III (10), I	III (2)			
	<i>yaebegach</i>	III				
	<i>yael</i>	III				
	<i>yaelog</i>	III				
	<i>yafath</i>	III				
	<i>yaewal</i>	III				
	<i>yaewavriis</i>	III				
	<i>yaetaetaei</i>	III				
	<i>yaemwoelh</i>	III				
	<i>yaegafitaeg</i>	III				
	<i>kapateeyae</i>	III				
	<i>beeyae</i>	III				
	<i>yaetoulap</i>	I				
ye.....	<i>Faragiye</i>	III				
yoa.....	<i>yoarw</i>	XVI				
yoah.....	<i>yoah</i>	XVI	II			
	<i>yoahlagilh</i>	XVI	I			
yoeh.....	<i>yoeh</i>	XVI	V			
-y.....	<i>semwoey</i>	16 (2)				
	<i>seemwoey</i>	16 (2)				
	<i>baey</i>	III				
	<i>ihy</i>	III (2)				
	<i>mangiy</i>	III				
	<i>gaimangiy</i>	III (2)				
	<i>tafeey</i>	III				
	<i>gawaewaay</i>	III (2)	IV			
	<i>lihwanhaey</i>	IV				
	<i>kepatekay</i>	IV+III				



Tattooing in native script on arm of Maralatuy, a woman of Faraulep Island, Faraulep atoll. (Photographed by E. Quackenbush.)



Tattooing in native script on leg of Letaweribul, a woman of Falalap Island, Woleai atoll.
(Photographed by E. Quackenbush.)



Native script and Japanese *katakana* on canoe-house beams, Faraulep Island, Faraulep atoll. (a, b, Photographed by S. Kaneshiro; c, photographed by E. Quackenbush.)