# PHONOLOGICAL PATTERNING OF ENGLISH LOAN WORDS IN TONGAN[1]

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## 0. INTRODUCTION

From the time of the Tongans' first contact with English-speaking people, there has been a need to borrow English words for the new things encountered, such as items of material culture, personal names, and social and religious institutions. Used by generally monolingual speakers, the borrowings have been adapted to fit the Tongan phonological system, with only one major change in the system itself (see 3.1).

The changes a word undergoes in its shift of linguistic affiliation are sometimes startling, especially if the phonological systems are as different as those of English and Tongan. The following example was given by a traveller in 1855: "...the names of some of the Missionaries, if written according to the native mode of spelling, would be a complete puzzle to their friends at home. Mr. Waterhouse, for instance, they call Uatehousi. One of the Missionaries, in learning the language, came to a new and hard word, and asked its meaning of a native. 'Why, don't you know your own language?' said



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the man. It was an English word rendered unintelligible by the introduction of vowels."[2]

## 0.1 Purpose

It is an assumption based on other kinds of regularities of sound systems that the phonemic shape of a Tongan word borrowed from English should be predictable from the shape of its model. For maximum regularity, certain ideal (and unrealistic) conditions would need to be present:

1. Only one dialect for the source.
2. Only one dialect for the Tongan speaker who coins the form.
3. One period in time for the borrowing, hence excluding the possibility of linguistic change through time.
4. An absence of cultural or linguistic features that might make a new form unacceptable. Such a feature might be a taboo system or a desire to avoid homophonous forms of any kind.

This study aims to devise a set of rules that will account for the forms of as many of the borrowings as possible, and to discuss hypothetical (since absence of etymological data in most instances makes verification impossible) reasons for the departures from the rules.

## 0.2 Methodology

The data consist of approximately 1,275 words. Most of these were taken from Churchward (1959), in which English borrowings are conveniently marked with †. Also included are the words described by Churchward as follows: "...after consultation with my native assistant, I have invented a Tonganized form of an English word that has not yet been assimilated but whose assimilation is almost certain to be called for sooner or later. See, for example, palafini (*paraffin*) and paikeleti (*pikelet*). All such words are marked with the sign ‡..."[3] Words indicated as having a Catholic origin were largely ignored in the present study, since the source for most was Latin.

Some additional words were found in *Koe Kalonikali*, a current Tongan language newspaper. Other examples were supplied by Sione Fiefia, a student at the East-West Center at the University of Hawaii from 1964-66, and a former translator for the Education Department in Tonga. Mr. Fiefia supplied several kinds of information:

1. Additional words, some of which were too recent to be found in Churchward.
2. Opinions as to the suitability of certain adaptations in Churchward. When he disagreed with the dictionary form of the word, his own version was usually a better fit for the tentative rules that had been formulated up to that point. These forms were not used, but the fact that there was disagreement seemed worthy of note.
3. Hypothetical forms. Because of the limited data, the reflexes of certain sequences did not appear. For such cases, new words or nonsense forms were presented for the informant to adapt.

## 1. ENGLISH AND TONGAN PHONEMIC SYSTEMS

The most general statement about the phonemic systems is that English (E) has a much larger inventory than Tongan's (T) twelve consonants, five vowels, four stresses, and four junctures.[4]

| | | | | | | |
|---|---|---|---|---|---|---|
| p | t | k | ʔ | i | | u |
| f | s | | h | e | | o |
| v | | | | | a | |
| m | n | ŋ | | | | |
| | l | | | | | |

Tongan segmental phonemes

## 2. EQUIVALENCE RULES

Possible sets of rules vary in complexity, depending on the choice of unit to be rewritten. One choice is to rewrite an E phoneme as a T one; for example:

E /p/ → T /p/.

This type of rule might work best with two languages that have not necessarily similar stocks of segmental phonemes, but similar distributions of these phonemes within a syllable. This is not the case with E and T. An E syllable is defined in terms of vowel peaks. The peaks may be simple, as in /met/, or complex, as in /meyt/; and may be preceded by as many as three consonants, as in /streyt/, and followed by five, as in /ərnsts/. The T syllable can be most simply

defined (at least in slower speech) in terms of simple vowel peaks. That is, each vowel constitutes a syllable and may have an onset of one consonant. However, there are neither syllable codas nor consonant clusters. In T borrowings, ordinarily each E consonant is represented, and vowels are inserted where necessary to conform to the T canonical form. Thus, a set of phoneme-to-phoneme rules for the equivalences requires an additional set of rules to account for added and inserted vowels. In the following sections, certain patterning within this area is discussed, but rules are not given.

## 2.11 Consonant equivalences

### 2.111 Stops

Although T has stops at four positions--labial, alveolar, velar, and glottal--there is no voiced-voiceless contrast at the first three as there is in E. Since T stops are relatively unaspirated, they share features with both series of E stops. The equivalences are:

| ENGLISH | TONGAN | EXAMPLES |
|---|---|---|
| p,b | p | paasi *pass*; paa *bar*[5] |
| t | t,s | tii *tea*; kosi *goat* |
| d | t | talamu *drum*; tia *deer*; tiikoni *deacon* |
| k,g | k | ka?ate *card*; kini *guinea* |

### 2.112 Spirants and affricates

| ENGLISH | TONGAN | EXAMPLES |
|---|---|---|
| f | f | foketi *forget* |
| v | v | veeni *van* |
| θ | t,f | noate *north*; lefi *lath*[6] |
| ð | f | simufi *smooth*[6] |
| s,z | s | salute *salute*; sopu *soap*; iniseekite *insect*; suu *zoo*; kaisa *kaiser* |
| š,č,ǰ,ž | s,si | suu *shoe*; sieke *check*; seli *jelly*; seeini *chain*; peisi *beige*; Polonisia *Polynesia* |
| h | h | hoosi *horse* |

Nasals

| ENGLISH | TONGAN | EXAMPLES |
|---|---|---|
| m | m | moŋokuusi *mongoose* |
| n | n | noopele *noble* |
| ŋ | ŋ | moŋokuusi *mongoose* |

## 2.113 Lateral, retroflex, and glides

E /l/ in syllable-onset position regularly becomes T /l/, described by Morton[7] as having two major allophones: one with the central alveolar position, and a retroflexed variety occurring before back vowels. There are some examples of E /l/ in syllable-coda position (sometimes articulated with the back portion of the tongue relatively low) as T /o/.

E /r/ in syllable-onset position has two reflexes in T. The more common, T /l/ may have been based on the British flap [ɾ], which occurs in some dialects as the onset of a stressed syllable, but more often in unstressed intervocalic position.[8] The second variety, T /ul/, suggests that its model had considerable lip rounding and protrusion, and sonority.

E /w/ and /y/ becomes T /u/ and /i/, but in faster speech, the latter function more as glides than as vowel peaks.[9]

| ENGLISH | TONGAN | EXAMPLES |
|---|---|---|
| l | l | laipeli *library* |
| r(onset) | ul | ulapa *rubber* |
| | l | laise *rice* |
| w | u | uaine *wine* |
| y | i | iate *yard* |

## 2.12 Vowel equivalences

Presumably because of dialect diversity among the sources for E loan words, the span of time over which the words were borrowed, and the complications manifested by unstressed syllabics, vowel correspondences are less regular than those for consonants. For certain borrowings, we can assume some general features about the donor dialect. As would be expected, what is written as a post-vocalic r would be centering off-glide. Some words that appear with /æ/ and /a/ in the

present writer's dialect have been borrowed into T as /a/ and /o/, respectively, reflecting their British, or at least Commonwealth, source.[10]

The most frequent equivalences for the stressed syllabics are:

| ENGLISH | TONGAN | |
|---|---|---|
| /iy/ | /i/, /ii/ | |
| /i/ | /i/ is almost regular, with two examples of /e/ and one of /ii/. | |
| /ey/ | /e/, /ei/, /ee/ | |
| /e/ | /e/, /ee/ | |
| /æ/ | /a/, /aa/. There are three examples of /e/ or /ee/: seleki *shellac*, semileta *chamois leather*, and veeni *van*. In an experiment using nonsense forms, an informant used /e/ for some forms, /a/ for others. | |
| /a/ | /a/ | |
| /aw/ | /au/. There is one example of /ao/: saoa *shower*. | |
| /ay/ | /ai/. There are a few examples of /ae/. | |
| /ə/ | /a/. For examples of borrowings with /ə/ influenced by spelling, see 3.4. | |
| /ɔ/ | /o/, /oo/. There are three examples of /ao/, all from E words spelled with au. The source of sasepani *saucepan* would seem to be non-Commonwealth. | |
| /ow/ | /o/, /oo/, /ou/. /ou/ is more common in final position. | |
| /oy/ | /oi/ | |
| /u/ | /u/ | |
| /uw/ | /u/, /uu/ | |
| /uH/ | /ua/ | lekiua *liqueur* |
| /iH/ | /ia/ | paionia *pioneer* |
| /oH/ | /oa/ | kamatoa *commodore* |
| /awH/ | /aoa/ | hoosipaoa *horsepower* |
| /əH/ | /a/ | kaata *garter* |
| /eH/ | /ea/ | hea *hare* |
| /ayH/ | /aea/ | kuaea *quire* |
| /aH/ | /aa/ | maasi *march* |

## 2.13 Added vowels

To conform to the T syllable structure of CV or V, a vowel is added to all closed syllables of E loan words. Although any Tongan vowel can occur in this position, /ɪ/ accounts for more than half of the examples, and /e/ for most of the remainder.

The distribution of added vowels is partially phonologically conditioned. E /-k/ is likely to become T /-ka/; E /-əl/ or /-ɪl/ → T /-olo/. Examples for T /-u/ are few, but most come from E final labials, or non-labials preceded by /u/ or /uw/, or from syllabic /l/ preceded by a labial, e.g., pulumu *broom*.

One possible explanation for the limited examples of phonological conditioning is the relationship between the acoustic qualities of a particular consonant and any of the five possible vowels. In articulatory terms, the relationship could be described in terms of the vowel position nearest the position of the consonant. An example is the similarity between the articulatory positions of [s] and [i], and a check of the data reveals that the word-final vowel after /s/ is almost always /i/. But this correlation has little significance, since /ɪ/ is the only vowel that could follow the allophone [s] in an earlier system (see 3.1). Even with the newly-achieved phonemic status of /s/, the existing pattern would still prefer a following /ɪ/ rather than one of the other vowels.

The other apico-alveolar consonants, /t/ and /n/, are seldom followed by a vowel other than /ɪ/, but since /i/ accounts for the majority of cases, the other examples are too few to show any significant patterns. With more examples, a case might be made, however, for predicting a majority of occurrences of /a/ after /k/, with the tentative explanation that the lower jaw position allowed for /k/ permits a following lower vowel. Similarly, to some extent, a bilabial consonant may condition a following rounded vowel, but the occurrence of /o/ or /u/ seems to depend upon the occurrence of a preceding non-front vowel.

## 2.14 Inserted vowels

The phonological system allows some combinations phonetically similar to English consonant clusters or combinations. For example, palasitiki *plastic* occurs with a voiceless /ɪ/ between the /s/ and /t/; the medial /ɪ/ in pelekipooti *blackboard* is similar. Morton describes voiceless allophones for all T vowels, occurring in various environments, but most generally contiguous to voiceless consonants and pause juncture.[11]

Above the phonetic level, however, all E consonant clusters are interpreted in Tongan as one or more sequences of CV.

In E, a frequent initial cluster of two consonants is the type with a consonant followed by /l/ or /r/, both of which become T /l/. With a few exceptions, the form is regularly Cal, with C → /p t k f/. For the exceptions, the inserted vowel and the following vowel are the same: kulusa *cruiser*, homopuluu *homebrew*.

Most of the other clusters have added /i/. E.g., E /st/ → T /sit/; E /nd/ → T /nit/; E /nč/ → T /nis/; E /lm/ → T /lim/.

## 2.15 Initial vowels

E initial vowels, because of the usual non-phonemic glottal stop onset, are interpreted as T. /ʔV-/. E.g., ʔAlipate *Albert*, ʔovataimi *overtime*.

## 2.2 Phoneme-to-syllable rules

In this section is described a set of rules designed to eliminate a separate discussion of added and inserted vowels. The application of the first set of these rules (not to be equated with any kind of phrase structure rules, since ordering is not present) will produce a string of symbols, some of which correspond to phonemes in the T system. In this set, the underlined letter is a symbol to be rewritten later.

*SET I*

| ENGLISH | | TONGAN | ENGLISH | | TONGAN |
|---|---|---|---|---|---|
| p | → | p<u>u</u> | m | → | m<u>u</u> |
| b | → | p<u>u</u> | n | → | n<u>i</u> |
| t | → | t<u>i</u> | ŋ | → | ŋ<u>a</u> |
| d | → | t<u>i</u> | w | → | u |
| k | → | k<u>a</u> | y | → | i |
| g | → | k<u>a</u> | l | → | l<u>o</u> |
| f | → | f<u>i</u> | r | → | l<u>o</u> |
| v | → | v<u>i</u> | i | → | i |
| θ | → | t<u>i</u> | ɐ | → | e |
| ð | → | f<u>i</u> | æ | → | a |
| s | → | s<u>i</u> | a | → | a |
| z | → | s<u>i</u> | ə | → | a |
| š | → | s<u>i</u> | ɨ | → | i |
| ž | → | s<u>i</u> | ɔ | → | o |
| č | → | s<u>i</u> | u | → | u |
| ǰ | → | s<u>i</u> | H | → | a |

The rules in a second set perform certain operations on the strings produced by the first. In the following, the rules and their applicability--and in some cases, their weaknesses--are discussed.

1. $\underline{v} \rightarrow \# \; / \; -V$

V elsewhere

Set I generates from E CC T CVCV. So far the output of the rule is satisfactory. But E CCV produces T CVCVV. The above rule rewrites this VV as the appropriate V.

2. $V_1 + V_1 + V_1 \rightarrow V_1 + V_1$

Since T has no sequences of three identical vowels, this rule reduces such a sequence.

3. # V → ʔV

See 2.15.

4. $V_1 + \acute{V}_1 \rightarrow V_1$

T permits geminate vowels with the stress on the second vowel. Although this stress pattern appears in some borrowed words, for example hoosi *horse* and looti *lord*, the result is quite unlike the English model. As a latter discussion on stress indicates, this area has been the most difficult to describe consistently.

5.

| Unstressed E | | T |
|---|---|---|
| iy | → | i |
| ey | → | e |
| uw | → | u |
| ow | → | o |

This set of rules simplifies English diphthongs in unstressed position.

6. The preceding sequences are also simplified when the second element, corresponding to the E offglide, would receive regular penultimate stress. Thus, *pouni becomes pone *pony* (The final vowel is not accounted for by any of the rules); *lisoulo becomes lisolo *rissole*.

7. Although Morton posits four degrees of stress for a T utterance,[12] word stress (for words of four or fewer syllables) can be more simply described as alternating, with the primary stress on the penultimate syllable and secondary stress on the alternate preceding syllable. For words of five syllables or more, the pattern is not

regular, except for the penultimate stress. If a **T V**, rewritten from **v**, or corresponding to an unstressed **E V**, falls on the penultimate syllable of a generated form, there has to be some way of changing the stress pattern to match more nearly that of the **E** model.

The data show two methods of matching this stress. The first is to double a vowel so that the stresses match. For example, **E** /sǽt+n/ *satin*, by the rules of Set I and the first of Set II, is rewritten *****satini. Since the regular stress pattern would produce *****satíni, saatini is the form used.

The second method, used for words without added vowels, doubles the final vowel. Although the penultimate vowel of this form does not correspond to the primary stressed vowel of the **E** model, the stress has been moved from the inserted vowel. For example, **E** /pɪǽstə/ would produce **T** *****pulasíta. The form that does occur in palasitaa.

It would be possible to state this patterning as a formal rule to account for such data as the examples. But for many of the data, no attempt has been made to match the **E** stress pattern. The equivalences here show much less regularity than those for the segmental phonemes.

The following are sample results of the rules applied to several random sets of consecutive dictionary entries of **E** origin. The first is given step by step; the remainder show only the phonemic shape of the **E** word to be rewritten, the result of the application of the rules in Set I (indicated here with an asterisk), the rules used in Set II, and the dictionary form.

| | | |
|---|---|---|
| 1. | /kaH/ *car* | |
| | k → ka | ka |
| | a → a | kaa |
| | H → a | kaaa |
| | Rule 1, Set II | kaa |
| | Dictionary form | kaa |
| 2. | /gæf/ *gaff* → kaafi → *****kafi (Rule 1) | kaafi |
| 3. | /gaHtə/ *garter* → kaaatia → *****kaata (1) | kaata |
| 4. | /kaHd/ *card* → kaaati → *****kaati (1) | kaati |
| 5. | /kæf/ *calf* → kaafi → *****kafi (1) | kafi |
| 6. | /kaysə/ *kaiser* → kaaisia → *****kaisa (1) | kaisa |
| 7. | /gayd/ *guide* → kaaiti → *****kaiti (1) | kaiti |
| 8. | /kækt+s/ *cactus* → kaakatiisi → *****kakatisi (1) | kakatisi |

| | | |
|---|---|---|
| 9. | /græf/ *graph* → kaloafi → *kalafi (1) | kalafi |
| 10. | /bɔlpen/ *ball (point) pen* → puolopueni → *polopeni (1) | polopeni |
| 11. | /brəš/ *brush* → puloasi → *pulasi (1) | polosi |
| 12. | /bɔlsəm/ *balsam* → puolosiamu → *polosamu (1) | polosomo |
| 13. | /bowlt/ *bolt* → puoulo†i → *pouloti (1) | polota |
| 14. | /blɔtiŋ/ *blotting (paper)* → puloo†iŋa → *pulotiŋa (1) | pulootiŋi |
| 15. | /bɔm/ *bomb* → puomu → *pomu (1) | pomi |
| 16. | /pɔmgræn†t/ *pomegranate* → puomukaloaniit→ *pomukalaniti (1) | pomikanite |
| 17. | /powni/ *pony* → puouni → *poni (1, 6) | pone |
| 18. | /tyuwzde/ *Tuesday* → tiiuusite → *tiuusite (1) | tuusite |
| 19. | /dyuwtl/ *duty* → tiiuutii → *tiuti (1, 4) | tute |
| 20. | /mænə/ *manna* → muania → *mana (1) | mana |
| 21. | /mæn†fest/ *manifest* → muaniifiesiti → *manifesiti (1) | manifesi |
| 22. | /mænlɔk/ *manioc* → muaniioka → *manioka (1) | maanioke |
| 23. | /mænyuwskript/ *manuscript* → muaniiuusikaloiputi → *maniuusikaliputi (1) | maniusikilipi |
| 24. | /mənuwvə/ *manoeuvre* → muaniuuvia → *manuva (1, 4) | manuva |
| 25. | /mæp/ *map* → muapu → *mapu (1) | mape |

## 3. DISCUSSION

The following examples represent forms that were generated with the preceding rules and that differ from the dictionary entries (in parentheses). After each example is a discussion of the discrepancy.

### 3.1 *goat* → *koti (kosi)

The T /t/ ∿ /s/ alternate correspondence for E /t/ reflects an earlier stage of the T phonemic system in which the sequence /ti/ was phonetically [sɪ], [tšɪ], or a similar manifestation of palatalization. In the dictionary and grammar appended to Mariner (1827),

the author uses *ch* to represent the sound used in "the English words *choose, change, chair,* etc." Those words written with *ch,* and also with *j,* are now pronounced with [s]. However the change took place, the whole process is a fairly common one. In Nadrogā (Viti Levu, Fiji), /t/ occurs as [s] before /i/ and /e/; in parts of Lau (Eastern Group, Fiji), /t/ occurs as [tš] before /i/. The phonemic status of T [s] could still be open to question if its occurrence before vowels other than /i/ were limited only to loan words from E. But there is a relatively large number of words (fifty-three, for example, with initial *s* followed by some vowel other than /i/) that are obviously not E in origin. There are two possible opposing explanations.

According to Morton[13] "...no matter whether /t/ and /s/ had overlapping distribution before /i/ in earlier times or not, the two phonemes have existed in Tongan for a long time, perhaps since Tongan broke off [from] the proto-language." This assertion seems doubtful, since we have no way of knowing how long the present /s/ words have existed in T. It is simpler to suppose that all instances of [s] followed by a vowel other than /i/ are early borrowings. Some evidence can be found for this hypothesis by looking for similar forms in Fijian and Samoan, likely sources for loan words. To a certain extent, the search is successful in Fijian: saa *rafter,* saləto *nettle plant,* salusalu *lei,* soo *assembly,* and about twenty-five others were found readily from the group of fifty-three. The number would probably be higher if a Lau glossary were available, since this is the area with which T has had the most contact. Samoan sources were not examined.

Both of the above extremes are unsatisfactory; the first cannot be supported by any evidence, and the second is somewhat analogous to eliminating /ž/ from E because it didn't exist in an earlier form of the language and is an influence of loan words. It is more reasonable to use a solution similar to that adopted for Tagalog /i/, /e/ and /u/, /o/: an earlier form of the language probably did not make these contrasts, but because of the large number of loan words assimilated into the language, all the contrasts now exist.

Existing loan words with /s/ show little regularity of pattern. As seen below, T /s/ may be followed by a vowel other than /i/. Of the 256 instances, twenty-one correspond to E /š/; sixteen to E /ǰ/; fifteen to E /z/; eight to E /č/; and two to E /ž/. The remainder correspond to E /s/. Examples of the forms are:

| | | | |
|---|---|---|---|
| 'evolusone | *evolution* | Sune | *June* |
| falakiseni | *fraction* | seniale | *general* |
| suu | *shoe* | sangiketi | *junket* |
| palesema | *plasma* | saafa | *chaff* |
| suu | *zoo* | saliote | *vehicle (chariot)* |
| saa | *czar* | selo | *cello* |
| viisone | *vision* | | |

The number of examples of /si/ in loan words is greater, but many of these correspond to E /s/ before another consonant. For example:

| | | | |
|---|---|---|---|
| sitoni | *stone* | sikilini | *screen* |
| talaasiti | *trustee* | sipeiti | *spade* |

There are a few examples of T /si/ corresponding to a single E affricate:

| | | | |
|---|---|---|---|
| Sione | *John* | siasi | *church* |
| sieke | *check* | Siamane | *Germany* |
| siete | *jet* | siaa | *jar* |
| sioka | *joker* | siaakete | *jacket* |
| sieka | *Chinese checkers* | siaki | *jack (cards)* |
| liisione | *legion* | siakolo | *jackal* |
| Siaina | *China* | Siapani | *Japan* |
| siemu | *germ* | siamu | *jam* |
| siate | *chart* | siasipa | *jasper* |

For these examples, rule 1 in Set II does not operate.

Because of the irregularity of patterning shown by E loan words with /s/, we are led to speculate that the T system may have been undergoing some changes at the time these words were borrowed. One would expect the earliest borrowings to have the shape /si/ exclusively. The pattern may have been broken for two possible reasons. First, as T /s/ became more established from Pacific loan words, new borrowings may have assumed /s/ alone, without the following /i/; and less common forms, not stabilized by frequency of occurrence either in speech or writing, may have changed from /si/ to /s/. Second, the /i/ following the /s/ may, in certain positions, have occurred phonetically voiceless or as a prolongation of the spirant. Currently, both of these phenomena can occur in the language. This may have had an effect on the written form.

### 3.2 *harp* → *hapu (ha?ape)

The reflex of E /aH/ appears as T /a?a/ in a few words: ka?ate *card* or *guard*, Ma?asi *Mars* or *March*, ma?ata *martyr*.

### 3.3 *gold* → *kooloti (koula)

Some homorganic clusters of nasal, spirant, or lateral plus stop are reduced, especially in final position. In most of the examples, the stop is omitted: leni or lani *land*, uini *wind*, Metotisi *Methodist*, lisi *list*.

### 3.4 *gulf* → *kaalofi (kuulifi)

Occasionally, it is possible to tell from the shape of a borrowing whether its coiner was a Tongan who heard the word and adapted it himself, or a non-native speaker who constructed his own translation. A probable example of the former is kosi *goat*. At the other extreme is a set of words with obvious spelling translations. *U* spellings for E /ə/ or /ɨ/ are the most common type. Examples are litiume *lithium* and linooliume *linoleum*.

Another occasional spelling-influenced translation is T /u/ instead of /lu/ in such words as musiume *museum*, and musika *music*, although both may be from non-English sources.

The choice between /-i/ and /-e/ as added vowels may be influenced by spelling. In one sample, 30% of the /-e/ words, but only 18% of the /-i/ words are derived from E words spelled with so-called final *silent e*.

### 3.5 Other types of discrepancies

In spite of the tendency toward phonemic patterning there must be other factors operating to produce a pair as paluna *balloon* and palatuni *platoon*. Analogy within one language itself seems a reasonable possibility. In an experiment with a T informant, the following translations were produced for a list of E monosyllables, some of them nonsense forms:

| ENGLISH | TONGAN |
|---|---|
| /tlym | /tiimi |
| tim | timi |
| teym | teimi |
| tem | temi |

| ENGLISH | TONGAN |
|---|---|
| tæm | teemi |
| təm | tamu |
| tam | taamu |
| tuwm | tuumu |
| tum | tumu |
| towm | toumu |
| tom | tomu |
| taym | taimi |
| tawm | taumi |
| toym/ | toimi/ |

The same English vowels were inserted into the following frames--/p_m/, /t_n/, /t_p/, /t_b/--but the final vowel for the T form was /i/ each case. The writer can make no claims for statistical accuracy on the basis of one hastily-designed experiment with one subject, but the results do indicate that analogy might play a part in the choice of final vowel.

Another non-phonemic criterion for the form of borrowings is avoidance of forms homophonous with those already existing in the language, especially scatological terminology and words connected with the Deity. For example, when asked if *looti wouldn't be a better translation than loti for *rod*,[14] one informant explained that *looti would 'clash' with the word for *Lord*. Likewise, *hoosi, one suggested correction of the dictionary entry hosetia *host, consecrated bread*, was rejected because it means *horse*. The informant also corrected some entries, for example, kafi *calf* to kaafi, since the former meant *naughty boy*.

3.6 Two of the conditions posited for maximum regularity in the adapting of borrowed forms were one dialect for the source and one period of time for the borrowing. Both these conditions were present for the forms Churchward himself coined and included in the dictionary (see 0.2). One would expect somewhat more regularity from this set. The following is a comparison of the dictionary entries (last column) with the forms generated from twenty-five words in this category.

1. /greyhawnd/ *greyhound* → kaloeihiauniti → *kaleihauniti (1) — kaleihauniti
2. /grɨneyd/ *grenade* → kaloinieiti → *kalineti (1, 6) — keleneiti
3. /koHnlə/ *cornea* → kaoaniia → *koania (1) — koonia

| | | |
|---|---|---|
| 4. | /kwayə/ *quire* → kauaia → *kuaia (1) | kuaea |
| 5. | /laHk/ *lark* → loaaka → *laaka (1) | laaka |
| 6. | /laHkspə/ *larkspur* → loaakasipua → *laakasipaa (1, 8) | laakisipaa |
| 7. | /lænɬln/ *lanolin* → loaniiloini → *lanilini (1) | lanoline |
| 8. | /ræčɬt/ *ratchet* → loasiiti → *lasiti (1) | laseti |
| 9. | /legəHn/ *leghorn* → loekaaani → *lekani (1, 4) | lekone |
| 10. | /regyuleytə/ *regulator* → loekaiuloeitia → *lekiuleta (1, 6) | lekuleta |
| 11. | /lentɬl/ *lentil* → loenitiilo → *lenitilo (1) | lenitile |
| 12. | /rés ɬply/ *recipe* → loesiipuii → *leesipi (1, 5, 7) | lesepii |
| 13. | /rɬsówl/ *rissole* → loisioulo → *lisolo (1, 6) | lisolo |
| 14. | /lowgənberl/ *loganberry* → looukaanipueloi → *loukanipeli (1) | lokanipeli |
| 15. | /rɔbɬn/ *robin* → loopuini → *lopini (1) | lopini |
| 16. | /mægniyzləm/ *magnesium* → muakaniiisiiamu → *makaniisiamu (1) | makanesiume |
| 17. | /mæksɬm/ *maxim* → muakasiimu → *makasimu (1) | makesemi |
| 18. | /nekt ərlyn/ *nectarine* → niekatialoiinl → *nekatalini (1, 4) | nekataline |
| 19. | /paykl ɬt/ *pikelet* → puaikaloiti → *paikaliti (1) | paikaliti |
| 20. | /baysep/ *bicep(s)* → puaisiepu → *paisepu (1) | paisepi |
| 21. | /pləmə/ *plumber* → puloamua → *pulama (1) | palama |
| 22. | /plæstlk/ *plastic* → puioasitiika → *pulasitika (1) | palasitika |
| 23. | /pænθə/ *panther* → puanitia → *panita (1) | panita |
| 24. | /plvɬt/ *pivot* → puiviiti → *piviti (1) | pivota |
| 25. | /brɔnz/ *bronze* → puloonisi → *pulonisi (1) | puloniise |

The degree of discrepancy between the generated forms and the dictionary forms was not expected. Although disagreements in the earlier set were treated as weaknesses of the rules (on the basis that the data are always correct), for the latter set it seems fair to question Churchward's choices.

One word, makanesiume *magnesium* is a clear example of the influence of spelling. Other possibilities are the o's in the words for *lanoline* and *pivot*, and the absence of any reflex of the y glide in the word for *regulator*.

Churchward's inconsistencies, along with those found between different speakers of Tongan, help point toward one of the most general reasons for some of the so-called exceptions to the most common patterns: some speakers can handle the adaptation of loan words better than others.

## 4. DIRECTIONS FOR FURTHER STUDY

### 4.1 Collateral studies

Among the better-studied languages of the Pacific, none seem to have resisted borrowing from European languages. Correspondence rules for Hawaiian, with its limited number of consonants, would be particularly interesting. For example, English /t d θ s z ž č ǰ k g/ are all borrowed as Hawaiian /k/.[15] Also worthy of study is the choice of added and inserted vowels in various languages borrowing the same vocabulary items. As an example of the variation that exists, *Albert* is borrowed as ʔAlapaki in Hawaiian, Alipate in Fijian, and ʔAlipate in Tongan. For some words, the choice of vowels is the same: Hawaiian maakeke and Fijian maakete for *market*.

### 4.2 Studies in depth

Although the rules in the present paper were set up merely to account for as many of the data as possible, they may ultimately be shown to bear some relationship--making an analogy to one of the claims of transformational grammatical theory--to the process the coiner has gone through to produce the assimilated form of an English borrowing.

Certainly the tools of acoustic phonetics and distinctive-feature analysis need to be applied. And eventually it may prove more convenient to use as base forms the phonetic, rather than the phonemic, shapes of the English words.

## NOTES

1. I wish to thank Samuel H. Elbert, George W. Grace, and Bruce G. Biggs for reading the manuscript at various stages in its development.

2. Farmer 1905:147.

3. Churchward 1959:viii.

4. Morton 1962:2.

5. Tongan orthography uses both geminate vowels and macrons to mark what is analyzed phonemically as geminate vowels. For this study, vowels with macrons have been rewritten as geminate.

6. No examples of this equivalence were found in Churchward. The item given was the response of the informant when asked to adapt new words.

7. Morton 1962:42.

8. Jones 1950:195.

9. Morton 1962:43.

10. Early in the study, an attempt was made to use a modified British phonology. In the present version, the only concession to such a system is the centering offglide in place of the writer's own /r/.

11. Morton 1962:42-54.

12. Morton 1962:2.

13. Morton 1962:12.

14. At the time, the writer was trying to incorporate into the equivalence rules the phonetic lengthening of vowels voiced consonants in English.

15. Pukui and Elbert 1957:xvii.

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