

This character without doubt is found in the Ponape dialect, becoming not *o* emphatic, but *o* locative, an office not very dissimilar to its Hawaiian use. It is used to point out, or as one may say to locate persons or things. Of a canoe it would be said, if far away, *war o*, the canoe yonder in the distance. So of a man *ol o*, so of some subject under discussion which has been remarked about, then dropped, the thought *o*. As a locative, in the plural it is suffixed to the root letter of the particle of plurality *kan*, thus. *k + o = ko* or *ako* with prefixed vowel, and in use stands thus: *war ako*, the canoes yonder, *jop ako*, the ships yonder, *ran ako*, the days passed away.

In Ponape this particle often adds to its power of location and becomes almost an adjective meaning 'same,' as *war o ta*, the canoe yonder, the same one seen but a little while before; *aramaj o ta*, the same person disappearing has reappeared; *likau o ta*, the same cloth shown a little while since. Such are the offices to which *o* locative is appointed in the Ponape dialect. Possessing a little less or a little higher power than "*o* emphatic" in Hawaiian no one would for a moment doubt but that the two are one and the same particle. It was so recognised by the Rev. L. H. Gulick.¹

[The Hawaiian particle *o* is of course the same as the common Polynesian *ko*, Samoan 'o, used principally with absolute nominative cases of nouns in an assertive sense. The only Melanesian language which employs it in this sense is the Fiji, but as a demonstrative the word is very common throughout the Melanesian region. Cf. Neugone, *o re koe*, the ship, a certain known ship; Aneiteum, *aïen aïg ko*, that same yonder is he, *ko*, an affix meaning yonder; Tanna, *nadi igo*, that thing, *in igo*, that there; with the Ponape examples above. Dr. Codrington² gives *ko*, *ka* or *o* as a demonstrative particle in the New Hebrides, Arago and Santo; in Bank's Islands, Gaua, Vanualava, and Motlav. The Solomon Islands Ulawa *ho* is probably the same. The Fiji has the particle

¹ Ponape Grammar, p. 20.

² Melanesian Languages, p. 105.

nasalized as *nggo* (*go*) equivalent to "this," or "here." In Mota it appears as an article *o tanun*, the man.]

§ 6. *La* DIRECTIVE.

Closely allied to *o* emphatic, not in office but as an important particle is the word *la*. In Hawaiian it is "a beautiful expletive" accompanying all verbal directives. It is said also to have "a slight reference to locality." Its position in the sentence changes the accent.

In Ponape the same particle meets us, not the same merely in orthography but often in similar uses, as well as in dissimilar, though the latter by no means negative its uses in similarity. In Ponape *la* seems often in its uses to be merely an "expletive," it often has reference to locality, it largely affects the accent when suffixed, but its more important use is as a directive, putting things to the farthest extreme of time and space. It at times seems to give to the verb a passive power; thus, *a me la*, he is dead, *a o la*, it is broken; but these passive sentences can easily be referred to *la* as directive.

[The particle is of common use in the Polynesian dialects. In Samoan *la* is "there," and *ra* is used in the same way in Rarotongan and Tahitian. In Nukuhivan *na* is used like the Hawaiian *la*, and the Mangarevan *ara* is used both of place and time. In the Melanesian languages *la* is used as a demonstrative, chiefly relating to place, pointing to an object as this, or that, to a place as here or there. The degree of nearness or remoteness indicated varies in different languages, but the demonstrative character of the word is plain. In the following table I give a summary of the forms found.

Simple—

1. Pointing near, ("this," or "here") *la, lo, le*.
2. Pointing far, ("that" or "there") *la, lo, li*.
3. Indefinite, *la, lo, le, li*.

Compounds with other particles—

1. Pointing near, *ro-ne, ku-ri, ke-li*.
2. Pointing far, *ka-la, nia-la, ku-ra, re-k*.

The languages in which these forms occur extend from the Loyalty Islands to the Solomons. In New Guinea and the Malay Region *la* is not apparent as a demonstrative, but is probably found in the Malagasy *iry*, that afar, *ary*, there.]

§ 7. PREPOSITIONS.

The prepositions of Hawaii and Ponape have much in common, though in form they widely differ.

The Hawaiian are: *a, o, ka, ko, na, no, i, ma, me, mai*.

The Ponape are: *en, ong, ni, iang, ki, pa, pan, ren, jong*.

The Hawaiian Grammar refers to two classes of these particles, the "simple" and the "compound." The "compounds" are the simple prepositions joined to other words, generally denoting place, and they may be regarded as "adverbs of place." The Ponape also possesses compound forms, but in these the simple prepositions suffix pronouns rather than adverbs, and they may be called pronominal prepositions rather than adverbs of place.

The "simple prepositions" possess in both tongues the mere office of "showing a connection and relation between other words."

There are three features to be especially noted as common to the two languages.

1. The simple prepositions are used to decline the noun and pronoun. The Hawaiian noun is spoken of as declined, but it is not declined in the proper sense of the term, *i.e.*, by possessing terminals to denote its relation to other parts of speech, as in Greek, Latin or German. There is nothing of this. But these simple prepositions come in, or some of them, to denote the relation of the noun, whether in the genitive, or dative, or other cases. As these are well marked by the preposition, the noun is spoken of as declined, an expression proper enough if it be understood. It has not been usual to speak of the Ponape noun as thus declined. It has been described as possessing the three general divisions, nominative, possessive, objective, but the last case was made to include the dative, accusative and ablative. This form of expressing the noun or pronoun arose from the fact that it is

very generally found with a possessive particle suffixed or prefixed. It is not in this respect, altogether like the Hawaiian free, or largely so.

In the Ponape almost every noun takes, as we have said, its possessive. But with these attached particles the preposition enters to play its part, and gives the cases—the Hawaiian noun possesses, the Genitive taking *en*, of, the Dative *ong*, to or for, the Accusative *ong*, to, the Ablative *ki* or *pan*, meaning by, and further taking *iang*, *ren*, denoting with.

If then the Ponape noun is arranged with the prepositions as in Hawaiian, we shall have it much the same. And this, it will be seen is not a mere form, but because the conditions as truly make for it as those affecting the Hawaiian noun.

2. The second point to notice with regard to the simple prepositions or some of them is, that they possess the power of marking a shade of difference among persons or things, a difference which the native mind is ever disposed to make. The objects of nature, persons and things, animate and inanimate, are often the subject of the narrowest distinctions. The Ponape mind has gone still further and made sharp distinctions in articles to be enumerated, and appointed *class* particles to designate them.¹

In the Hawaiian the two prepositions *a* and *o*, while performing their prepositional office, take a further duty, *a* will denote one class of object, *o* another. As the grammar puts it “whatever relates to instruction, learning, work, food (and it may be added, children) requires *a*; whatever relates to one’s own passions, person, residence, clothing, takes *o*.”²

Passing to the Ponape noun we find the same method of marking the shades of difference, but different articles will be included.

¹ This use of classificatory particles is found also in Melanesian languages. Cf. Codrington, *Mel. Lang.* pp. 242, 305. In New Guinea also the numerals are preceded by words showing the kind of thing counted.

² Though called prepositions by Mr. Doane, these words may be shown to be really nouns. Cf. Codrington, *Mel. Lang.* p. 132. They are the only nouns which, in the Polynesian languages have retained the possessive suffixes.

What the Hawaiian would put into one category the Ponapean would put into another. This will be discussed further on.

3. The third point is the distinction inherent in the Hawaiian prepositions *ka* and *ko*. Their office is to express the possessive case, or that case expressed by the apostrophic 's in English, *ko ka hale*, the house's or that which belongs to the house, *ko ke kino*, the body's, or that which belongs to the body.¹

The Ponape impresses much the same law on the particle *en*, using one particle rather than two. The first office of *en* is simply prepositional, to denote the relation expressed by the preposition of. But it has a larger use, to give forms or turns to the genitive, similar to the *ka* and *ko* of the Hawaiian. It does not as distinctly denote the form of the apostrophic 's, but it does give another meaning to the simple possessive. This will be more distinctly seen in the examples of declension.

The singular noun with the prepositions will sufficiently illustrate the points under discussion.

Hawaiian—KA HALE, the house.

| | | |
|------|----------------------|------------------------------------|
| Nom. | <i>ka hale</i> , | the house. |
| Gen. | <i>o ka hale</i> , | a <i>ka hale</i> , of the house. |
| | <i>ko ka hale</i> , | <i>ka ka hale</i> , the house's. |
| Dat. | <i>no ka hale</i> , | <i>na ka hale</i> , for the house. |
| Acc. | <i>i ka hale</i> , | the house. |
| | <i>ma ka hale</i> , | at or to the house. |
| Voc. | <i>e ka hale</i> , | o the house. |
| Abl. | <i>mai ka hale</i> , | from the house. |
| | <i>me ka hale</i> , | with the house. |
| | <i>e ka hale</i> , | by the house. |

Ponape—OL, man.

| | | |
|-----------|----------------------|---|
| Nom.—Nom. | <i>ol</i> , | man. |
| Poss. | Gen. <i>ol en</i> , | man of. |
| | Gen. <i>en ol</i> , | <i>na</i> , <i>a</i> , of the man. |
| Obj. | Dat. <i>ong ol</i> , | for the man. |
| | Acc. <i>ong ol</i> , | <i>ni ol</i> , to or at the man. |
| | Voc. <i>ol la</i> , | man o. |
| | Abl. <i>ren ol</i> , | <i>iang ol</i> , with the man. |
| | Abl. <i>pan ol</i> , | <i>ki ol</i> , <i>jong ol</i> , of or from the man. |

¹ *Ka* and *ko* are abbreviations of *ka a*, *ke a*, or *ka o*, *ke o*, i.e. the article with the possessive words *a* and *o*.

Looking at the Hawaiian noun as thus declined we see how completely this is done by the prepositions, and notice that the Ponape noun may be declined in the same way. We observe the force of the preposition *en*, and its twofold use. The first simply denotes of, as man of, while the second use, of the man; or the man's denotes that which more particularly pertains to, or belongs to the man. Here we get much that is analogous to the Hawaiian *ka*, *ko*, yet as we have remarked, it does not denote simply and solely the apostrophic 's. It may do so, but the idea is rather to give a new form to the genitive. At times it seems to be required by the peculiar state of the noun with its suffix or prefix, and sometimes seems to be demanded to satisfy the ceremonial form of address. But we need not remark further, the two forms exist and hold much that is analogous to the Hawaiian *ka* and *ko*.

Then as to that other very peculiar and marked characteristic of the two tongues, to denote "the shade of difference between things" in the Ponape the law is as marked as in the Hawaiian, but in the Ponape it is expressed by the two particles *na*, *a*, *personal pronouns*, rather than prepositions.¹ *Na* equals *a* in Hawaiian covering the possessive of certain things, while *a* in Ponape also indicates the possessive and resembles in its shade distinction the *o* of Hawaiian. These words will be further referred to under pronouns.

§ 8. NOUNS.

We cannot better present these than by following somewhat closely the order of the Hawaiian Grammar.

1. The Hawaiian noun takes both the abstract and the concrete state, so also does the Ponape, though in the latter the abstract is the more common.

¹ Since these words correspond to what Dr. Codrington has called Possessives (Mel. Lang. p. 128), and are used in Ponape with suffixed pronouns, like nouns denoting relationships and parts of the body, *e.g.*, *nai*, *nom*, *na*, etc., *ai*, *am*, *a*, etc., it would be more correct to call them possessive nouns. *A* is of general use; *na* is used of kava, sugar cane, banana, dog, child, fowl and is of more limited application.

| Examples. | Hawaiian. | Ponape. |
|-----------|--------------------------------|------------------------------------|
| Abstract | <i>ka oiaio</i> , the truth | <i>pirap</i> , theft |
| | <i>ka pono</i> , the justice | <i>lamalam</i> , purpose |
| | <i>ke kaumaha</i> , the weight | <i>likak</i> , grief |
| | <i>ka ino</i> , the badness | <i>toto</i> , weight |
| Concrete | <i>elemakule</i> , an old man | <i>kirip</i> , unmarried person |
| | <i>luwahine</i> , an old woman | <i>peneinei</i> , a married couple |
| | <i>halau</i> , a long house | <i>tanipaj</i> , a chief's house |
| | <i>oopa</i> , a lame person | <i>pokolong</i> , a cripple. |

2. The Hawaiian noun is often formed by prefixing a syllable to the "radical form." The syllables so used are, *ma*, *na*, *po*, *ko*, *o*, thus:—

malu, shade, *mamalu*, umbrella
hae, to break, *nahaehae*, rent, broken
ino, bad, *poino*, unfortunate.¹

Ponape observes the same rule but with different particles:

pirap, to steal, *li-pirap*, a thief.
patak, to teach, *joun patak*, a teacher.²
porone, to send, *wan-poron*, a messenger.

The Ponape particles most generally used are *li*, *jou*, *wan*, *ai*, *ka*, *kan*.

3. In Hawaiian person, number, gender, and case are not indicated by any change in the noun itself. The same applies to Ponape.

4. The singular, dual and plural numbers are distinguished in both languages, but there is no change in the noun itself, particles of peculiar form being used.

5. The signs of the Hawaiian dual and plural are, (excluding numerals) *na*, *mau*, *poe*, *pae*, *puu*.

¹ Examples of this formation are not very clear in the Hawaiian Grammar. The words given are verbs rather than nouns.

² The word *jou* is the Melanesian *ta* or *tau*, man. Cf. *jou n patak*, man of teaching, with the New Guinea Motu, *ahediba tauna*, teaching its man.

In Ponape the particles are, *a*, *ka an* (or *ke en*), *kan*, *kat*, *ka*, *ko*.¹

Hawaiian *na* denotes indefinitely large numbers, *poe* is a sign of plurality as indefinite, but is restricted to the set or company of things under discussion, and is used more in reference to persons and animals than to inanimate objects. *Pae* and *pau* have much the same office of plurality as *poe*, but refer rather to collections of things inanimate.

In Ponape, *kaan* (or *keen*) gives plurality, but with the special idea of "repetition," "rows." *Kan* denotes plurality, any number above duality. *Kat* refers to numbers equally as large, but they must be things "at hand" in close proximity; the particle does not notice the kind of thing, whether animate or inanimate. *Ka* is much the same as *kat*, but refers to objects or persons at a little further remove. *Ko* still expresses plurality large or small, above the dual, but has no reference to persons, or things distant in time or place.²

Tabulated the particles would stand thus:—

HAWAIIAN.

Na, plurality indefinitely large.

Pae, plurality of objects under discussion and objects inanimate.

Pau, nearly the same as *pae*.

Poe, plurality, relating to things under discussion, excluding all others, refers to animate objects.

PONAPE.

Kaan (or *keen*), plurality, but things in rows; repetition.

Kan, plurality, all above duality.

Kat, plurality, but only of things at hand.

¹ In Gulick's Ponape Grammar *ka* seems to be used as a noun of multitude. *Ka'n im* a multitude or collection of houses, (*Cf.* Fiji *vei vale*) a village. *Kan* is not referred to separately, but is given as a demonstrative, all these or those. *Ko* is given as a pronoun and referred to a demonstrative *kao*.

² In Mortlock Island *kana* is the usual sign of the plural. In Ebon, Marshall Island, *ko* is used for the plural, except with names of human beings.

Ka, plurality of things under discussion but a little more removed.
Ko, plurality of things under discussion, far removed, but animate or inanimate.

The Hawaiian Grammar gives all the above particles as also signs of the dual, adding to them the *mau*, as an expression to denote a few.

The table shows how each language is governed by a common law in expressing the dual or plural by particles.

6. *Gender*.—"There is nothing in Hawaiian to mark the genders of nouns." The real difference, existing in animate beings is denoted by words expressive of sex. This is denoted by the words *kane*, male, *wahine*, female.¹ The same rule applies to the Ponape, the words used being *ol*, male, and *li*, female. In both languages different words are used to designate the gender, as the words for parents, children, animals or fowls.

§ 9. ADJECTIVES.

There is much similarity in the use of the adjective.

1. The Adjective of Quality.

Hawaiian—*He manawa loihi*, a long time.

He papa makolukolu,² a thick board.

Ponape—*Anjou uarai*, a long time.

Par en tuka mejul,² a thick board.

2. Adjective of Quantity.

Hawaiian—*He makani oluolu*, a pleasant breeze.

Ka la ino, the stormy day.

Ponape—*Ang tik*, a light breeze.

Ran katauin, a rainy day.

¹ Sam. *tane*, *fafine*, etc.

² These words *makolukolu*, and *mejul* are representatives of a more common *matolu*. Cf. Samoan *matolutolu*, thick (pork), Maori, *matotoru*, Efate *matulu*, Malekula, *metetir*, Epi, *mererolu*, Mota, *matoltol*. All of these words have the conditional prefix *ma*. Cf. also the Fiji *tolo*, the thick part of the body or of a tree.

3. The Adjective of Number.

Hawaiian—*Lehulehu na kanaka*, numerous people.

Na kanaka umi, the ten men.

Ponape—*Aramaj ngeter*, many persons.

Ol rick, twenty men.

The general law of the adjective of both tongues is, that it shall follow the noun qualified. It is exceptional when it does not.

In Hawaiian the numeral is allowed to precede the noun. This is at times the case in the Ponape, though usually the numeral follows the noun, thus:—

Hawaiian—*Eha hale kula*, four school houses.

Elima la papa ka oleo ana, five days perhaps the discussion lasted.

Ponape—*Ran limau*, five days.

Im patak uonu, six school houses.

4. In both languages a particle prefixed to an adjective becomes its copula,¹ to express or affirm the quality of the adjective. In Hawaiian the particles are *wa*, *he*, thus:

wa ino, it is bad; *wa maikai*, it is good.

he ino, it is bad; *wa loiho ke ala*, long is the road.

In the Ponape this equally marked, but only one particle is used, thus:—

me juit, it is bad; *me mau*, it is good.

me rai rai, it is long; *me tikitik*, it is small.²

¹ In these we probably have the remains of former verbal particles. Cf. *wa* with Banks Island *we*.—Mel. Lang. p. 276.

² Gulick (Amer. Orient. Soc. Journ., Vol. x., p. 30) regards this *me* as the same as the Polynesian *mea*, thing, substance, any person or thing mentioned; *me mau*, thing good, or the thing (or it) is beautiful. There seems, however, very little doubt but that it is the particle *ma* or *me*, which is almost universally used in Melanesia to express the condition in which a thing is.—(Mel. Lang. p. 169, 188). It seems possible so to regard it in Ponape. Gulick states "It very commonly takes the power of a personal pronoun and stands in apposition with the nominative of a verb, so heightening the affirmative force of a sentence, and almost entitling it to the term "affirmative particle." e.g., *kowa me wiata*, you are the one that did (it). *Ape me koto*, such a one has come. In this affirmative use, we may compare *me* with the *m*, *me* or *ma* so common in Melanesia as a verbal sign.

5. *Comparison of Adjectives*.—The three degrees, positive, comparative, and superlative, common to all languages are here expressed much in the same way, though by different agents.

Particles are used in both languages to form these degrees, the two latter especially.

In Hawaiian the positive degree is the simple expressed subject, long, short, white, black. There is nothing in the adjective to express comparison, thus :

Hawaiian Positive, *poko*, short

Comparative, *poko iki*, short a little

poko ae, shorter (*lit.* short really)¹

poko iki ae, shorter still.

Superlative, *poko loa*, shortest, very short.²

In Ponape the order is somewhat different, especially in the comparative. The positive simply asserts the long or short, the good or bad, the black or white condition of things under discussion. The comparative appropriates the preposition *jong*, from to express its comparison, as, this is white from, or whiter than that.³ The comparative as in Hawaiian is often expressed by simply stating that one thing is different from another, as, this is long, that is short; this is good, that is bad. The superlative is formed by suffixing the particle *ia*, and by taking a heavy accent.

Ponape Positive, *mau*, good.

Comparative, *mau jong*, better than (*lit.* good from)

puot jong, whiter than (*lit.* white from)

Superlative, *mau ia*, best of all, supremely good.

puotopuot ia, whitest of all.

¹ *Ae* in Marquesan augments the force of the word to which it is added and forms a comparative.

² *Loa*, really means long (of time and measure), here it means very or excessive.

³ This is the common Melanesian Method. Cf. Ex. in Codrington's Mel. Lang. Mota, *o qoe we poa ran o gasuwe*; Maewo, New Hebrides, *a qoe u lata dan na garivi*; Wango, Solomon Islands, *bo raha bania kasuwe*, a pig is big from a rat; New Britain, *ingala tadiat*, it is large from them.

[Mr. Doane has not discussed the use of *maj* in Ponape with the superlative. This word intensifies the quality or number expressed by the adjective, *maj totoia*, very numerous indeed, *majapueka*, exceeding afraid. It is the same as the Duke of York Islands and New Britain, *mat* and the Florida, Solomon Island *mata*, and in these languages it is used as an intensive in the same way. Duke of York *liralira mat*, very white, New Britain *I ququ mat*, he rejoices very much. The word is probably the common Oceanic *mata*, eye, face, front, also used as an adverb, before.]

PART II.

§ 10. NUMERALS.

The numerals are distinguished in both Ponape and Hawaii as cardinal and ordinal. Hawaii also possesses distributive forms. The first ten numbers stand thus :

| CARDINAL. | | ORDINAL. | |
|-----------|-----------|----------|--------------------|
| Hawaii. | Ponape. | Hawaii. | Ponape. |
| 1. kahi | at | ka mua | ka at ¹ |
| 2. lua | ari | ka lua | ka ari |
| 3. kolu | ejil | ka kolu | ka ejil |
| 4. ha | apong | ka ha | ka apong |
| 5. lima | alim | ka lima | ka alim |
| 6. ono | auon | ka ono | ka auon |
| 7. hiku | ej | ka hiku | ka ej |
| 8. walu | aual | ka walu | ka aual |
| 9. iwa | atu | ka iwa | ka atu |
| 10. umi | katongaul | ka umi | ka tongaul |

In the formation of the ordinal, particles come into use which are alike in form and office. In the Hawaiian it is the definite article *ka*, in the Ponape the causative. In what we may call the infancy of things, both were no doubt one, but in the lapse of ages and wide roaming of the people from the home land they became possessed of different powers. One people has taken *ka*

¹ This ordinal is often *ka moa*, the first, before all others, the first in precedence.—Rev. E.T.D.

for the definite article, the other has appropriated to it, the office of a causative.

[The names of the numbers in these decimal systems are substantially the same in both languages, but the Ponape words for four and nine, *apong* and *atu* are uncommon. These agree with the Palau Islands *awang*, *oang*, four, and *ettew*, *etew*, nine, which are probably only forms of the common *wa*, *fa*, and *sio*, *siwo*.

The Hawaiian *kahi* by a regular change of *t* to *k*, and *s* to *h*, is the common Polynesian *tasi*, which, though probably formed from the root *ta* or *sa*, common in Melanesia does not agree with it so closely as the Ponape *at*. The change of *t* to *k*, and *f* to *h* in Hawaiian, and of *t* to *j* in Ponape show *kolu* and *ejil*, *hiku* and *ej* to be the common *tolu* and *fitu*.

The ordinals in Hawaiian appear to follow the ordinary Polynesian rule and prefix the article as in Maori, *te tahi*, *te rua*, *te toru*, Samoan 'o le *lua*, 'o le *tolu*. The Ponape *ka* prefixed though identical in form with the causative prefix may not be really the same. In Fiji and other Melanesian languages, and also in Malay, the ordinal is formed by a prefix *ka* or *ke*, e.g., Fiji *karua* second, Efate and Nguna *kerua* second, *kelima* fifth, Malay *kaduwa* second. In these languages *ka* is not the causative prefix and hence the Ponape *ka* (and possibly the Hawaiian) may be of similar origin to the Fiji *ka*. In Melanesia the causative prefix usually forms a multiplicative numeral as in Banks' Islands *vaga-rua*, twice, *vaga-tol*, thrice. This form is also found as ordinal in some parts of Melanesia, but usually with a substantive termination. In Malagasy also the causative *faha* forms an ordinal *faha-roa*, second. The Ponape ordinal *ka moa* shows the word *moa* or *mua*, used in many languages of Oceania for "front," "before." Banks' Islands *moai*, first.]

The Hawaiian Grammar notes that "Formerly, in counting, the Hawaiians, when they reached the number forty turned back and commenced at one and counted another forty, and so on till they laid aside ten forties; these ten forties they called a *lau*,

four hundred. It is a modern improvement that the word *kana* has been prefixed to *lima*, *ono*, *hiku* etc. to express fifty, sixty, seventy, etc. At the present time the Hawaiian enumerate by units, tens, hundreds, thousands. The words *haneri*, hundred, *tausani*, thousand, *miliona*, million, have been introduced from the English.

The order of counting by fours was as follows :

| | | | |
|-------------------|---------------|-------------------|-----------------------|
| <i>aha kahi</i> | = four units | = 1 <i>kauna</i> | = 4 |
| <i>umi kauna</i> | = ten fours | = 1 <i>kanaha</i> | = 40 |
| <i>umi kanaha</i> | = ten forties | = 1 <i>lau</i> | = 400 |
| <i>umi lau</i> | = ten 400s | = 1 <i>mano</i> | = 4000 |
| <i>umi mano</i> | = ten 4000s | = 1 <i>kini</i> | = 40000 |
| <i>umi kini</i> | = ten 40000s | = 1 <i>lehu</i> | = 400000 ¹ |

Turning now to the Ponape we find the same method of fours in use. It is less perfect than the Hawaiian, but though simpler was probably derived from a common system. The terms are as follows :

| | | | |
|---------|-----------------------|--------------|-----|
| | Four units are termed | <i>at</i> | = 1 |
| Another | „ „ „ „ | <i>ari</i> | = 2 |
| „ | „ „ „ „ | <i>ejil</i> | = 3 |
| „ | „ „ „ „ | <i>apong</i> | = 4 |
| „ | „ „ „ „ | <i>alim</i> | = 5 |

This order is followed till the tenth number is reached which is called forty. This order repeated gives $40 + 40 = 80$, this repeated again $= 80 + 40$, i.e., 120 and so on *ad infinitum*.

The Ponape system is the simpler of the two, but it seems quite impossible that two peoples should have such a system unless they held much in common to both.

¹ These words have various meanings in the other Polynesian dialects. *Kauna* may be the same as the Tongan and Maori *te kau*, ten pairs. *Kana-ha* is simply 'ten fours.' *Lau* is 100 in Samoan, and is the Tongan *au*, Rarotongan *rau*, also meaning 100. *Mano* is 1000 in Maori, 2000 in Rarotongan and Tahitian, 10000 in Samoan, Tongan, and 4000 in Hawaiian and Marquesan. The Hawaiian *kini*, Marquesan *tini* is 40000, but Maori *tini* is 10000, and Rarotongan 20000, and an indefinitely large number in Mangarevan. Hawaiian *lehu* is Tahitian *rehu*, 200000, Fiji *levu*, great.

§ 11. PRONOUNS.

The personal pronouns in these tongues are :

| HAWAIIAN. | | PONAPEAN. | |
|--------------------------|-------------|-----------------------------------|-------------|
| Singular. | | Singular. | |
| <i>au, wau</i> | I | <i>ngai, ī</i> | I |
| <i>oe</i> | you | <i>koe (komui, chief's lang.)</i> | you |
| <i>ia</i> | he, she, it | <i>ī, a</i> | he, she, it |
| Dual. | | Dual. | |
| <i>maua</i> (exclusive) | We two | <i>kita</i> (exclusive) | We two |
| <i>kaua</i> (inclusive) | We two | <i>kit</i> (inclusive) | We two |
| <i>olua</i> | you two | <i>koma</i> | you two |
| <i>lana</i> | they two | <i>ira</i> | they two |
| Plural. | | Plural. | |
| <i>makou</i> (exclusive) | We | <i>kit, je</i> | we |
| <i>kakou</i> | we | <i>kitail</i> | we |
| <i>oukou</i> | you | <i>komail</i> | you |
| <i>lakou</i> | they | <i>irail</i> | they |

In the second personal pronoun the Hawaiian *oe* is Ponape *koe*. In the third person *ia* is bisected in Ponape but intact in Hawaii. Both tongues have forms in the dual and plural to express the inclusion or exclusion of the person addressed. All wear a strong family look.

[The Hawaiian pronouns are substantially the same as in other Polynesian languages. In the dual first and third persons *ua* is an abbreviation of the numeral *lua*, two. Similarly in the plural *kou*, is an abbreviation of *kolu*, three, the common *tolu*.

The Ponape presents some differences which are worth noting. *Ngai* is a Melanesian rather than a Polynesian form. In the dual and plural *ki, i*, may be regarded as demonstratives, and are used similarly in many Melanesian languages.¹ In the plural *il* is an abbreviation of *ejil*, three.² The root forms compared in the two languages are thus

¹ Cf. also the Tongan *kimaua*, *kitaua*, etc., Aniwa *agimawa*, *agitawa*.

² Cf. similar abbreviations in the Solomon Islands Languages.—Codrington, Mel. Lang. p. 507, 512, etc.

| | | | | | | | | |
|--------------------|-------------|--------------|------------|-----------------|-------------|-------------|-------------|--------------|
| | 1 | 2 | 3 | | 1 | 2 | 3 | |
| Singular, Hawaiian | <i>au</i> , | <i>oe</i> , | <i>ia</i> | Plural Hawaiian | <i>ma</i> , | <i>ta</i> , | <i>o</i> , | <i>la</i> |
| Ponape | <i>ī</i> , | <i>koe</i> , | <i>i</i> . | Ponape | <i>t</i> , | <i>ta</i> , | <i>om</i> , | <i>ra</i> .] |

With the prepositions the first personal pronouns are as follows :

| HAWAIIAN. | | | PONAPE. | | |
|-----------|-------------------|-------------------|---------|---------------------|----------------------|
| Nom. | <i>au, wau</i> | I | Nom. | <i>Ngai, ī</i> | I |
| Gen. | <i>o'u, a'u</i> | of me | 202 { | Gen. | <i>nai, ai</i> mine |
| Gen. | <i>ko'u, ka'u</i> | mine [to me | | Gen. | <i>en nai, en ai</i> |
| Dat. | <i>no'u, na'u</i> | for me, belonging | Dat. | <i>ong ia</i> | for me |
| Acc. | <i>ia'u</i> | me, to me [of me | Dat. | <i>ong, nai, ai</i> | for mine |
| Acc. | <i>ma o'u la</i> | by me, by means | Acc. | <i>ongia</i> | to me |
| Abl. | <i>mai o'u la</i> | from me | Abl. | <i>rei</i> | with me |
| Abl. | <i>me au</i> | with me, like me | Abl. | <i>pai</i> | by me as |
| Abl. | <i>e au</i> | by me as agent | | | agent. |

The chief features in the plural and dual are the distinction between the exclusive and inclusive in the first person, but there is no need to give here the full forms. The point to notice in the declension of the pronoun is the distinction made in the use of the genitive singular, and the agreement of the two languages. The Ponape *nai* and *ai* of the first person, *nom* and *am* of the second, *na* and *a* of the third, agree with the double forms of the Hawaiian *o'u*, *a'u*, for first person, *ou*, *au* of the second, *ona*, *ana* of the third. The use of these may be sufficiently illustrated by the Ponape *nai* and *ai* for the first person singular genitive. These words are both suffix and prefix, at least *ai* is emphatically so, thus *uar ai*, canoe my, or *ai uar*, my canoe; so also *ai im*, my house, *im ai*, my house. The *nai* is more generally a prefix. It is doubtful if it ever becomes a suffix, if so, only in a special sense. As possessive pronouns both are important, and it is in this pronominal form that they carry the character of the Hawaiian prepositions *a* and *o*, and indicate the "shade of difference between things" which has been already spoken of (§ 7 Prepositions).

The Ponape *a* is the equivalent of the Hawaiian *o*, and stands as the exponent of all possessions, goods, lands, boats, canoes, largely things with which to work, then relations, the brother,

sister, uncle, aunt, parents, and wife. Ponape *nai* is the *a* of Hawaii, and possesses a narrower range of service. It refers to children, to servants, to trees and their fruits, to certain implements of work, and also to things which are highly prized. The two pronouns stand thus in wide contrast, and may be thus illustrated: In what may be called the "stone and shell age" of this people, the possession of a piece of iron hoop was of more worth than its weight in gold; and one getting possession of a knife, that was a treasure indeed, at once addressed it as *nai kapit*, my knife, but his wife at his side, a piece of property he could pick up at any time or anywhere was addressed as *ai pant*, my wife.

We need not further illustrate this point, we only refer to it to show how fully this idea of the different shade of things has possessed the Ponape mind. It is as strong with him as with the Hawaiian. But while the Hawaiian lets the preposition bear the the office of expressing the "shade of difference," the Ponapean has passed it on to the personal pronoun.

We may perhaps say here all that is needed to be said on the prefixed pronoun of the Hawaiian. It is simply the inferior brought to the front, made to face about and take a new position; *he aina o'u*, the land of mine; *he kapa o'u*, the cloth of mine become *ko'u aina*, my land; *ko'u kapa*, my cloth.

Now as we have intimated above in the remarks on *nai* and *ai*, Ponape possesses the same order, sometimes a prefix, sometimes a suffix. But the change cannot be so fully made as in the Hawaiian, for certain articles are restricted to either the suffix or prefix, but apart from this the idea is the same.

[The distinction made between nouns when used with the possessive pronoun, or rather the difference made in the pronoun when used with certain nouns, though obscure in the Ponape and Hawaiian may be clearly understood by reference to the Melanesian languages. In these certain nouns are used with a pronoun suffixed, others require a particular form of possessive word to be used with them, and the latter can always be shown to consist of

another noun with a suffixed pronoun. Thus taking examples from Mota of Banks' Islands and from Fiji, we have :

1. Mota *-k*, Fiji *nggu*, used as suffixed pronouns to names of parts of the body and relationships : *qatu-k*, *ulu-nggu*, my head, *tama-k*, *tama-nggu*, my father. The Ponape suffixed pronoun is also used with the same kind of nouns : *mong-ai*, my head, *jam-ai*, my father. So also other Micronesian languages : Gilbert Islands *atu-ku*, *tama-ku*, Marshall Islands *bor-a*, *jem-a*. No examples of this construction are found in the Polynesian languages.

2. In Mota 'my garment' is *no-k siopa*, Fiji, *no-nggu isulu*, where *no* is plainly a noun used with the same pronouns suffixed as in the previous examples. If *no* be translated "thing" or "property," the literal construction is my-thing (a) garment, and the Ponape *nai (na-ai) kapit*, my knife is of the same form. The Hawaiian *ko'u kapa*, my garment is in Maori *toku kakahu*, and in these the *'u* and *ku* are suffixed pronouns, being in fact of identical origin with the Mota, Fiji and Gilbert Island forms given above. The Hawaiian *k*, and Maori *t* represent the articles *ke* and *te*. Hence the *o* in Maori and Hawaiian may be regarded as of the same use as the Mota and Fiji *no* or the Ponape *na*. The construction is identical in the Melanesian, Micronesian and Polynesian tongues.

3. It is probable that the Ponape prefix possessive *ai* is distinct from the suffix *ai*, and that the pronoun is really *i*. Cf. the prepositions *rei*, with me, *ren*, with him, *pai*, with me, *pan*, with him.]

§ 12. VERBS.

1. The Hawaiian verb as shown in the grammar is certainly elaborate when compared with that of Ponape. Possessing about as many moods, the tenses are more numerous and fuller, so are the causative forms. The passive voice is more perfect. Whether we may call it "philosophical for a language to agglutinate to itself so many particles to explain the various shades of thought needing to be expressed, when the same particles in their tense

use often exchange themselves one for the other, may be questionable." But for the "philosophy of things we are not seeking." As a first remark upon the verb we may say, in almost the opening sentence of the Author of the Hawaiian Grammar, "in comparison with European languages the Hawaiian verb has many peculiarities. In every full sentence of these languages a verb is necessary to complete the idea intended. No so in Hawaiian; some of the most common, clear, and strong affirmatives are fully expressed without any verb." This feature is also characteristic of the Ponape verb.

2. We will here group as far as we can all that is said in a preliminary way of the verb.

- (1) The grammar states: In Hawaiian a verb is not necessary to complete the idea. This, as stated above is true also of the Ponape sentence.
- (2) In Hawaiian there is no verb to express the idea of existence or being. This is expressed by particles, and by the pronoun in the nominative or objective cases. Ponape has the same use.
- (3) There are no verbs in Hawaiian (and also in Ponape) to affirm the quality of a substance, this being done by adjectives, nouns or pronouns.
- (4) The verbs 'to possess,' 'to have,' in the Hawaiian are wanting, equally so in Ponape.
- (5) The verbs to express duty or obligation are wanting in Hawaiian and also in Ponape.
- (6) There are no variations of the Hawaiian verb to express number or person, neither are there any in the Ponape. In both languages the pronoun expresses these, and more distinctly than the noun.

3. We here reach what may be called the "accidents of the verb," and will now give the verb as affected by these. In the three numbers, singular, dual, and plural, the paradigm is as follows:—

| HAWAIIAN. | | PONAPE. | |
|-------------------|----------------------------------|--------------------|--------------------------------|
| <i>Hele</i> , go. | | <i>Tang</i> , run. | |
| Singular. | | Singular. | |
| 1st Person | <i>hele au</i> , I went | | <i>ngai tang</i> , I ran |
| 2nd Person | <i>hele oe</i> , You went | | <i>koe tang</i> , You ran |
| 3rd Person | <i>hele ia</i> , He went | | <i>a tang</i> , he ran |
| Dual. | | | |
| 1st Pers. (excl.) | <i>hele maua</i> , we two went | | <i>kit tang</i> , we two ran |
| 1st Pers. (incl.) | <i>hele kua</i> , we two went | | <i>kita tang</i> , we two ran |
| 2nd Person | <i>hele olua</i> , you two went | | <i>koma tang</i> , you two ran |
| 3rd Person | <i>hele laua</i> , they two went | | <i>ira tang</i> , they two ran |
| Plural. | | | |
| 1st Pers. (excl.) | <i>hele makou</i> , we went | | <i>kit tang</i> , we ran |
| 1st Pers. (incl.) | <i>hele kakou</i> , we went | | <i>kitail tang</i> , we ran |
| 2nd Person | <i>hele oukou</i> , you went | | <i>komail tang</i> , you ran |
| 3rd Person | <i>hele lakou</i> , they went | | <i>irail tang</i> , they ran. |

In this table we have the verb, simple, fixed and unvaried. In the Hawaiian it is simply *hele*, to go, in Ponape, *tang*, to run. There is not the least change in the verb, but person and number are entirely indicated by the pronoun.

4. *Moods*—In the Hawaiian there are four moods, Ponape possesses five, thus :

Hawaiian—Indicative, subjunctive, infinitive, imperative.

Ponape—Indicative, potential, subjunctive, infinitive, imperative.

5. *Tense*—It is the same with tense as with person and number, there is no alteration of the verb which expresses this. Particles must come in, and it may be remarked generally, that when particles are appointed to express the tense of the verb, there is not a little uncertainty about the whole matter. However as in both tongues the particles of time are used, they answer their purpose very well.

6. The Hawaiian Grammar begins with the preterite tense, and we follow the same order. There are five forms of this tense in Hawaiian, but only three in Ponape. In illustrating this point we will give the three Hawaiian corresponding to those of Ponape, in the singular of each form.

HAWAIIAN.

First form of the preterite. The simple form of the verb.

1. *holo au*, I ran
2. *holo oe*, you ran
3. *holo ia*, he ran

Second form; this form prefixes *a* to the verb, meaning "and when," thus:—

1. *a hana au*, and when I made
2. *a hana oe*, and when you made
3. *a hana ia*, and when he made

Fourth form; the verb prefixes *ua*.¹ This particle according to the grammar is more often used as the perfect tense.

1. *ua huna au*, I have concealed
2. *ua huna oe*, you have concealed
3. *ua huna ia*, he has concealed

7. *Future Tense*—The Hawaiian possesses two forms of this tense. The first prefixes *e* to the root,² the second has an additional *e* suffixed, thus:—

First Form.

1. *e lohe au*, I will hear
2. *e lohe oe*, you will hear
3. *e lohe ia*, he will hear

Second Form.

1. *e lohe e au*, I shall have heard
2. *e lohe e oe*, you will have heard
3. *e lohe e ia*, he will have heard

Ponape also possesses two forms of this tense. The first is denoted by the particle *pan*,³ "will," prefixed, the second by the particle *nok*, meaning "shall, intend," or "about to."

First Form.

1. *I pan rong*, I will hear

Second Form.

1. *I nok uia*, I shall or intend to do

¹ This is the common *kua* of Polynesia, usually a perfect sign.

² In Samoan, Maori, Tongan and Marquesan, *e* is both a present and future particle. In Rarotongan and Tahitian it is usually future, but sometimes present.

³ *Pan* is a verb common in Melanesia as *van*, *vano*, to go. Hence Ponape *pan rong* means "going to hear." Cf. Lifu *tro deng*, also meaning "going to hear."

2. *ko pan rong*, you will hear 2. *ko nok uia*, you will or intend
to do
3. *a pan rong*, he will hear 3. *a nok uia*, he will or intends to do

8. *Present Tense*—The present tense of the Hawaiian verb differs so materially from the Ponape, that both are here omitted.

9. *Subjunctive Mood*—Particles are used to indicate this mood in both languages, but the simpler use is found in Ponape.

10. *Imperative Mood*—The Hawaiian grammar shows two forms of this mood, both indicated by particles. The first prefixes *e* to the verb, thus: *e nana oe*, look you. The second form prefixes *mai*, “do not,” to the verb, thus: *mai huli oe*, do not you turn. The Ponape also possesses two forms, the first prefixing *en*, the second *ter*: e.g., *en ngar*, do you look, or simply, look; *ter tang*, do not run.

11. *Infinitive Mood*—In the Hawaiian, the grammar notes that this mood is not infrequently of the same form as the imperative, and can only be distinguished by the sense of the passage. This is also true of the Ponape verb. In Hawaiian, however, the particle *e* is prefixed to the root of the verb to indicate the “to” of the English infinitive.

§ 13. PARTICIPLES.

1 These are marked in the Hawaiian. Certain particles are used to designate them, called the present and preterite, e.g., *e lawe ana*, carrying; *i lawe ia*, carried. The same idea is not indicated in Ponape by a particle, but usually, the simple form of the verb is used participially. The reduplicated form of the verb gives a present participle, *tang*, to run, *tangtang*, running; *alu*, to walk, *alualu*, walking.

The Hawaiian has a *Gerund*. “It takes the definite article (*ka*) or a prefix pronoun”; *ka lawe*, the bearing, *ka papa*, the forbidding. Ponape possesses a part of speech similar to this, or it may be called a verbal noun. It prefixes, *ka* causative, and suffixes a prepositional pronoun, thus: *ka maua pa-i*, “the making good of me.”

2. *Other Verbal expressions*—(a) The Hawaiian possesses a passive voice, formed by suffixing *ia* to the root of the verb. Ponape also possesses a passive, which exists in two forms. The first, and more regular, prefixes the preposition *pa* to the root. The other form is made by suffixing certain particles to the root.

(b) The Hawaiian verb is reduplicated in the following ways:

- (1) First syllable only : *lawe*, to carry, *lalaawe*.
- (2) Both syllables ; *lawelawe*.
- (3) Second syllable only : *lawewe*.
- (4) First syllable is repeated three times : *lalalaawe*. This gives a frequentative sense, "to carry often."

The Ponape possesses some of these forms.

- (1) The simple root is reduplicated : *tang*, to run, *tangtang*.
- (2) First syllable only : *naitik*, to beget ; *nainaitik*.
- (3) The root except the last letter : *matang*, to play, *mata-matang*.
- (4) A syllable is inserted, similar in sound : *inta*, to say, *in(tin)ta*.

The reduplicated forms while somewhat numerous in Ponape, do not possess the power of the Hawaiian, to beget new forms of conjugation, nor is the meaning of the word so materially changed. The Hawaiian possesses a causative form, made by prefixing the particle *hoo* : *hoo-lawe*, to cause to carry, *hoola*, to save, to make live. Ponape has also a causative, formed by prefixing *ka* to the verbal root, *ka-maur*, to make live, *ka-mela*, to kill, make dead.

[Though so dissimilar in form these two prefixes are probably of identical origin. Hawaii is exceptional among the Polynesian languages in having the form *hoo* for the causative. The prefix is the same as the Marquesan *haa*, which by the elision of *k* and substitution of *h* for *f* is the *faka* of Tonga.¹

The prefix among the Melanesian languages takes similar variations. In Fiji it is *vaka*, in the New Hebrides, *vaka* or *vaga*,

¹ That the syllable *ho* is the representative of *fa* or *fe* is evident by comparing allied words in the Polynesian tongues : e.g., words for land, star : Hawaiian *honua*, *hoku* ; Tongan *fonua*, *fetuu* ; Samoan *fanua*, *fetu*.

in the Solomon Islands it is *faga* or *haa*. A very common Melanesian form is *fa*, *va*, *wa* or *ha*, in the Loyalty Islands *a* or *o*. Coming to the Micronesian languages we find the same prefix. As in Melanesia it is simplified by the suppression of the guttural so in Micronesia it is usually wanting in the labial. Hence the Kusaie *ak*, Ponape *kuk*, Ebon and Gilbert Islands *ka*. This is further weakened in the Mortlock Islands to *a*.]

§ 14. VERBAL DIRECTIVES.

“Verbs generally, in Hawaiian, are supposed to have a motion or tendency in some direction. This motion or tendency is expressed by several little *words* which follow as near after the verb as the construction of the sentence will allow. The motion is either *towards* the speaker or agent, or *from* him, *up* or *down* or *sideways*, either to the right hand or left. Even those verbs expressive of the most quiescent state, have this peculiarity. We have something similar in the English phrases, *drink up*, *drink down*, etc.” This paragraph from the Hawaiian Grammar applies also to Ponape.

Hawaiian Directives are:

Mai, hither, towards one

Aku, from the speaker

Iho, downwards

Ae, upwards

Ae, also means ‘sideways’ or oblique motion.

Ponape Directives are:

To, towards one

We, from one, a short distance

La, from one, at the farthest extreme

Ta, upwards

Ti, downwards.

[The Hawaiian directives are those common in Polynesia; *mai*, *atu*, *ifo*, *ake*. They are used also in most Melanesian languages, the two last in the fuller forms of *siwo* and *sake*. In Micronesia the Ponape directives seem to be limited to the Caroline Islands languages, Ebon has *tok*, hither, *lok*, thither. The Gilbert Islands have the Polynesian directives in the forms, *mai*, hither; *rio*, downwards, *rake*, upwards. The directive ‘thither’ is *nako*, which is commonly used as a verb ‘go’ in Melanesia. Cf. Fiji *lako*.]

The following table illustrates the use of the directives:

Hawaiian—*lawe au mai*, I brought hither

lawe au aku, I took away

lawe au iho, I took down

lawe au ae, I took up.

Ponape—*I ua to*, I brought here, to the speaker

I ua we, I carried from the speaker, a short distance

I ua la, I carried from the speaker, far off

I ua ti, I carried down

I ua ta, I brought up.

§ 15. SYNTAX.

Our remarks on this subject will be few, because in the main there is so much of unity. In the Hawaiian the subject is rarely the first member of a sentence—a verb may and *often* does take its place. On this point the divergency of the two tongues is marked. In Ponape the noun is usually the first member, and it is rare to see the verb in any other position than following its subject. In all the minor parts of speech, the adjective following the noun qualified, the adverb or directive its verb, the similarity in both tongues is striking.

[The Ponape order is that common in Melanesia, except in Fiji and a few other places. The Hawaiian is the usual Polynesian order.]

§ 16. COMPARATIVE VOCABULARY.

[In comparing these lists it must be remembered that in common Oceanic words: *t* is represented by *j* in Ponape, by *k* in Hawaiian; a common *f* is dropped in Ponape, and is *h* in Hawaiian; a common *k* is retained in Ponape, but is dropped in Hawaiian; the common *ng* is retained in Ponape, but becomes *n* in Hawaiian.]

| ENGLISH. | PONAPE. | HAWAIIAN. |
|------------|------------|----------------------------|
| Animal | <i>man</i> | <i>manu</i> , bird. Common |
| Bag | <i>et</i> | <i>eke</i> |
| Before | <i>moa</i> | <i>mua</i> . Common |
| Breadfruit | <i>mai</i> | <i>mei</i> |

| ENGLISH. | PONAPE. | HAWAIIAN. |
|--|----------------------------|--|
| By (prep.) | <i>ki</i> | <i>i</i> |
| Canoe | <i>uar</i> | <i>uaa.</i> Common <i>vaka</i> |
| Cold | <i>pau</i> | <i>hau,</i> cold breeze |
| Conjunction | <i>a</i> | <i>a</i> |
| Cocoanut tree | <i>ni</i> | <i>niu.</i> Common |
| Die | <i>mat</i> | <i>make.</i> Common <i>mate</i> |
| Face | <i>maja</i> | <i>maka,</i> eye or face. Common <i>mata</i> |
| Father | <i>jama</i> | <i>tama,</i> son. (<i>tama</i> expresses the relationship between father and son, rather than the persons.) |
| Fear | <i>majak</i> | <i>matau</i> |
| Fight | <i>pei</i> | <i>papai,</i> to strike |
| Fire | <i>ai, iai</i> | <i>ahi</i> |
| Fish | <i>man-ika</i> | <i>ia</i> |
| Five | <i>alin</i> | <i>lima.</i> Common |
| Fly, (insect) | <i>long</i> | <i>nano.</i> Common <i>lango</i> |
| Food, chewed | <i>mama</i> | <i>mama,</i> to chew |
| Fruit | <i>ua</i> | <i>hua</i> |
| Hand | <i>lim</i> (chief's lang.) | <i>lima.</i> Common |
| Hear | <i>rong</i> | <i>lono.</i> Common <i>rongo</i> |
| Mili, one of the Marshall Islands under which is the abode of the departed | <i>mili</i> | <i>milii,</i> god of the infernal regions |
| Moon | <i>marama</i> | <i>malama.</i> Root <i>lama,</i> shining. |
| Moss | <i>lim</i> | <i>limu</i> |
| Mouth | <i>au</i> | <i>auha</i> |
| Night | <i>pong</i> | <i>po</i> |

| ENGLISH. | PONAPE. | HAWAIIAN. |
|--------------------------|-----------------------------|---|
| Outrigger | <i>tam</i> | <i>ama</i> . Melanesian <i>sama</i> |
| Oven | <i>um</i> | <i>umu</i> . Common |
| Powerful (super-natural) | <i>manaman</i> | <i>mana</i> . Common. |
| Path, road | <i>al</i> | <i>ala</i> . Common |
| Pillow | <i>uilinga</i> | <i>uluna</i> . Banks Is. and Solomon Is. <i>ulunga</i> |
| Rain | <i>ut</i> | <i>ua</i> . Common <i>usa</i> |
| Round | <i>ponopon</i> | <i>poepoe</i> |
| Scales of fish | <i>un</i> | <i>unahi</i> |
| Seven | <i>iju</i> | <i>hiku</i> . Common <i>fitu</i> |
| Side (of precipice) | <i>pale</i> (side of house) | <i>pali</i> , a precipice |
| Skin | <i>kili</i> | <i>ili</i> . Common |
| Sky | <i>lang</i> | <i>lani</i> . Common <i>langi</i> |
| Spirit | <i>ani</i> | <i>uhani</i> |
| Star | <i>uju</i> | <i>hoku</i> . Common <i>fetu</i> |
| Stand | <i>u</i> | <i>ku</i> . Common <i>tu</i> |
| Tooth | <i>ngi</i> | <i>niho</i> |
| Walk | <i>alu</i> | <i>alu</i> |
| Want | <i>anane</i> | <i>anoi</i> , to covet |
| Weep | <i>jongi</i> | <i>kani-kau</i> . Com. <i>tangi</i> |
| You | <i>ko</i> | <i>oe</i> . |

THE PARABLE OF THE SOWER.—Luke viii., 5 - 8.

HAWAIIAN.
5. *Hele aku la ka mea lulu hua e lulu iho i kana hua ; a i kona lulu ana, helelei kekahi ma kapa alanui ; a hehiia iho la, a ua aiia iho la e na manu o ka lewa.*

6. *A helelei iho la kekahi maluna o ka pohaku ; a kupu ae la, mae koke iho la ia, no ka mea, aohe ona mau.*

PONAPE.
5. *Joumot men ko lan kamo-roka ta uan tuka kai : a ni a kamokamorok, akai mori ti pon kailan al; ap tiaka la, o manpir kai noma la.*

6. *A akai mori ti pon paip; a lao uoja ta, ap mongi ti pueki jota lamuilamuir.*

7. *A helelei iho la kekahi iwaena o ke kakalaioa; a kupu pu ke kakalaioa, a hihia iho la ia.*

8. *A helelei iho la kekahi ma ka lepo maikai; a kupu ae la ia, a hua mai la ia pahaneri ka hua. A pau kana hai ana ia mau mea, kahea mai la ia, O ka mea pepeiao lohe, e hoolohe ia.*

7. *A akai mori ti nan uel en karer; a karer iang uoja ta kajokia la.*

8. *A akai mori ti nan puel mau, puai ta, kaparapar pan pak meapuki. A er pena a kauue me pukat, ap majani, Me jalong a mia en rong uaja, i en rong.*

THE TENSILE AND COMPRESSIVE STRENGTHS OF MAGNESIUM.

By S. H. BARRACLOUGH, B.E., M.M.E.

[Read before the Royal Society of N. S. Wales, December 4, 1895.]

THE amount of experimental data available regarding the physical properties of magnesium is rather meagre, on which account the results of the tests herewith described may be of interest since there seems a possibility of the metal being in the future considerably used for constructional purposes. The following extract from an authoritative source will serve to indicate the most hopeful view that may justifiably be taken of the extent and nature of the future use of magnesium.¹ "Since the rolling of magnesium does not offer the slightest difficulty even in such forms as T I or angles, round or four cornered rods, or plates of 1 mm. thickness, and as pure magnesium is sufficiently resistant to atmospheric influences, and can be polished and easily cleaned, it lends itself on account of its lightness and relative strength to the construction of apparatus required to be made of metal and

¹ Journ. Soc. Chem. Indus., Vol. VI., p. 730.

also to be light—*e.g.*, nautical, physical and astronomical instruments. The working of magnesium requires heat. At 450° C. it can be rolled, pressed, worked, and brought into complicated forms. Screws and threads can be made from magnesium and these are considerably sharper and more exact than those from aluminium. Owing to its cheapness, magnesium can also be used in the manufacture of a variety of useful articles.”

The present tests were made principally on rolled or drawn rods, nearly half an inch in diameter, together with a few confirmatory tests on specimens of the magnesian wire used for illumination purposes before the now more usual “ribbon” was introduced.

Tensile tests of six of the rods, made just as they were received from the manufacturer, gave the following results:—

| No. of Test Piece. | Diameter. | Breaking Load lbs. | Breaking Load lbs. per sq. in. | Elastic Limit lbs. per sq. in. | Ductility per cent. | Modulus of Elasticity. |
|--------------------|-----------|--------------------|--------------------------------|--------------------------------|---------------------|------------------------|
| 1 | ·433 | 3500 | 23,800 | 8,800 | 4·2 | 2,040,000 |
| 2 | ·433 | 3250 | 22,050 | ... | ... | 1,860,000 |
| 3 | ·442 | 3200 | 20,900 | 10,780 | 1·8 | 2,060,000 |
| 4 | ·435 | 2900 | 19,500 | 8,400 | 2·5 | 1,830,000 |
| 5 | ·424 | 3500 | 24,800 | 7,090 | 3·1 | 1,930,000 |
| 6 | ·432 | 3300 | 22,500 | ... | 2·3 | ... |

The extensions were measured by means of a Thurston extensometer, over a length of four inches. Two further tensile tests were made on specimens turned in the lathe to the dimensions stated, and with the following results. The metal can be turned with great ease.

| No. | Diameter Inches. | Breaking Load lbs. | Breaking Load lbs. per sq. in. | Elongation per cent. | Contraction of Area per cent. |
|-----|------------------|--------------------|--------------------------------|----------------------|-------------------------------|
| 1 | ·335 | 2502 | 28,399 | 2·67 | 1·74 |
| 2 | ·351 | 2275 | 23,500 | 3·00 | 1·76 |

In these tests an attempt was made to obtain an autographic stress-strain diagram, but the apparatus ordinarily used for that purpose proved unsuitable for such a material as magnesium.

For the purposes of comparison several tests were made on specimens of ordinary commercial magnesium wire, giving results as follows :—

| No. | Mean Diameter. | Breaking Load lbs. | Average Breaking Load lbs. | Average Breaking Load lbs. per sq. in. |
|-----|----------------|--------------------|----------------------------|--|
| 1 | ·0245 | 16·7 | 16·87 | 35,800 |
| 2 | | 17·1 | | |
| 3 | | 17·0 | | |
| 4 | | 17·1 | | |
| 5 | | 16·5 | | |
| 6 | | 16·8 | | |

The compressive strength of three specimens was determined ; the dimensions of the pieces and the stresses being as follows :—

| No. | Length Inches. | Diameter Inches. | Maximum Crushing Load lbs. | Maximum Crushing Load lbs. per square inch. |
|-----|----------------|------------------|----------------------------|---|
| 1 | 1·48 | ·415 | 5425 | 40,126 |
| 2 | 1·465 | ·415 | 5320 | 39,349 |
| 3 | 1·34 | ·414 | 5695 | 42,310 |

It will thus be seen that the average tensile strength of the magnesium rods is slightly over ten tons per square inch, with an elastic limit of four tons per square inch. In the form of wire the tensile strength of the metal is considerably higher, averaging nearly sixteen tons per square inch. This is probably a parallel case to the notable difference between the tensile strength of ordinary steel rods and of steel wires. The average compressive strength of the magnesium is about eighteen tons per square inch.

These figures differ slightly from those given as the result of a series of tests made at the Charlottenburgh Mechanical Laboratory.¹ There the average tensile and compressive strengths were 23·2 and 27·2 kilogrammes per square mm., or about 14·7 and 17·3 tons per square inch respectively.

An interesting comparison may be made between the strength as related to the density of magnesium on the one side and of

¹ Journ. Soc. Chem. Indus., Vol. VI., p. 730.

aluminium and steel on the other. These two metals are chosen as aluminium is no doubt a rival to magnesium on the score of lightness, and steel on account of its strength.

The form in which the comparison is made is one very commonly adopted.

| Metal. | Weight per cubic foot lbs. | Tensile Strength lbs. per sq. in. | Length of a bar that just supports its own weight. |
|-------------------|----------------------------|-----------------------------------|--|
| Magnesium ... | 107.6 | 24,000 | 32,119 feet |
| Aluminium .. | 168 | 26,000 | 22,285 „ |
| Hard Struck Steel | 490 | 78,000 | 22,922 „ |

The figures for the aluminium and the steel are taken from a paper on "The materials of aeronautic Engineering," read by Dr. Thurston at the Engineering Congress, Chicago, 1893.

NOTE ON SOME PRODUCTS FROM THE FRUIT OF *PITTOSPORUM UNDULATUM* AND FROM THE LEAVES OF THE PEPPER TREE (*Schinus molle*).

By R. THRELFALL, M.A., Professor of Physics, University of Sydney.

[Read before the Royal Society of N. S. Wales, December 4, 1895.]

Pittosporum undulatum, so common in the bush around Sydney, not only produces flowers of exquisite scent, but bears an abundant crop of fruit. The fruit consists of slightly oval berries of about one centimeter in diameter. During the month of May these berries pass from a dark green to a bright orange hue, and in the following month usually split longitudinally, displaying a mass of dark coloured seeds or pips buried in a dark red mass of a pitch like substance. If the fruit is gathered when just ripe the pitchy mass is lighter in colour and I think rather more voluminous than is afterwards the case. Long before the fruit is ripe the pericarp and epidermis become more or less saturated with oil. The

epidermis is easily bruised by the fingers, and when this is done a strong scent peculiar to the fruit at once becomes noticeable. This odour resembles that of the rind of the tangerine orange, but is easily distinguished from the latter. During May 1894, I was struck with the great abundance of the fruit of *Pittosporum undulatum*, and determined to examine it in so far as my quite inadequate knowledge and opportunity permitted.

On cutting sections of the outer rind and examining them under the microscope, I expected to see globules of oil, but in this I was disappointed, either from incompetence as an observer or for some real reason which I do not understand, for subsequent observation showed that oil exists in abundance in this part of the fruit. Sections of the seeds showed a few globules of greenish oil, but not many.

I then compressed the ripe fruit in a screw filter-press, and from 500 grms. of fruit I obtained 70 cc. of a thick juice which was brownish-yellow in colour, smelt strongly of the oil and rapidly thickened on exposure to the air—or rather the surface did so.

On extracting this juice with alcohol and evaporating on the water bath, I obtained a fine green solution which had solidified by the next day to a hard green resin. This resin has a most pleasant smell, which so far as I know is quite peculiar to it, and which appears when the resin is heated—in the cold it is without any odour. During the evaporation of the alcohol the smell characteristic of the fruit was strongly marked, but it disappeared towards the close of the operation, whence I inferred that the odour of the fruit is probably due to the presence of an essential oil.

The juice also yields a watery extract, which when filtered and dried gives a brown mass. This brown substance has the bitter aromatic taste of the fruit. It was perfectly soluble in water and gave a blue-black precipitate with ferrous sulphate.

It was noticed that the seeds were not in any way crushed by the filter-press, and after several attempts it was decided to separate the seeds from the fruit, and to treat each part separately.

About three and a quarter kilos. of seeds surrounded by the pitchy matter were gradually collected, and an attempt was made to grind them in an iron mortar, but they were too hard to yield appreciably. Some of them therefore were pounded on an anvil with a heavy hammer. Finally, in the hope of softening the seeds, they were boiled in water for twelve hours, and afterwards a current of steam was passed through the still in order to remove any oil which might be removable by this process. The yield was a minute quantity of a white wax(?) with somewhat the same odour as that of the resin previously described. This wax was rather harder than tallow and is not perfectly soluble in alcohol. The water distilled over with the wax had a smell of the fruit, though this had degenerated to an unpleasant acrid odour.

The residue in the still consisting of the seeds and a trace of wax together with the watery extract was filtered, and a portion of the filtrate extracted with ether and with shale benzine. Both these substances produced such a heavy precipitate that the process was almost unmanageable. Neither ether nor benzine extracted any measurable amount of anything.

The watery extract was evaporated to dryness and yielded a brown mass which has not yet been further examined.

The seeds, when collected on a filter after undergoing the distillation process, were white and slimy on the surface, as if the resin had been partially decomposed. After stirring for an hour with a considerable quantity of alcohol the slimy mass dissolved. The alcoholic extract gave a mass of a dark red resin or pitch which has not yet been further examined except by heating. At first it yielded a smell as of turkey rhubarb, then of benzoic acid and finally an odour of the resin already referred to.

The seeds which had thus been freed from the pitch and soluble constituents were very hard, and an attempt was made to break them by compression in a mould on the testing machine. The press measured seven by seven inches and stood a pressure of 96,000 lbs. when it broke. The iron was greasy where the pressure

had acted most strongly, but no appearance of anything like a yield of oil was obtained, hence it was decided to abandon the pursuit of this oil for the time being.

An alcoholic extract of the husks from which the pitchy matter had been removed was prepared. This yielded an abundance of the green resin already referred to. It is clear therefore that both the characteristic resin and essential oil came from the pericarp and not from the seeds.

In order to obtain the essential oil of the pericarp some three kilograms of husks were prepared. These husks were placed in a copper still with about their own volume of water, and then distilled by means of a current of steam led in to the apparatus, the still itself being kept hot by means of a moderate flame. An abundant yield of oil was the result.

As it was now clear that nothing was to be gained by separating the pericarp from the seeds, I proceeded to submit the whole fruit to steam distillation in quantities of five to seven kilograms at a time. The greater part of the oil came over in the portions of water first collected. As the process went on, the yield soon grew to be so small as to be unremunerative, partly owing to the slight solubility of the oil in water. The yield is about 180 cc. of oil from 50 kilograms of fruit, which was the quantity operated upon by me. It takes about two and a half hours to extract the oil from each lot of fruit, starting with boiling water and passing steam at a pressure of three or four pounds per square inch through a half inch pipe into the still.

The oil obtained by distillation has at first a rather acrid odour, but this is possibly due to traces of the accompanying water, for on drying by means of fused calcium chloride the odour quickly improves, and in a few days becomes almost the same as that of the bruised fruit.

On submitting the dried oil to fractionation the following results were obtained. The oil began to boil at about 174° C., and 60–65 cc. were treated.



Doane, Edward T and Ray, Sidney H. 1895. "A comparison of the languages of Ponape and Hawaii." *Journal and proceedings of the Royal Society of New South Wales* 29, 420–453. <https://doi.org/10.5962/p.359223>.

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