

# DATABASES IN CONTEXT: FROM SOURCES TO USERS

Meeting of the JSPS International Leading Research Project:  
Establishing Spatiotemporal Linguistics: A New Approach to the  
Interdisciplinary Study of Language History and Human Movement.

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# About this presentation

Linguistic databases come in many forms; I will describe just a few that I have created and worked with. I'll show examples of:

- databases ranging across several of the different database types
- how databases fit into the workflow from disparate data sources, to phases of enrichment, to database design and building, and to the development of apps

# About this presentation

Examples of digital support for endangered languages, including:

- web projects
- archives
- language resource and language learning apps

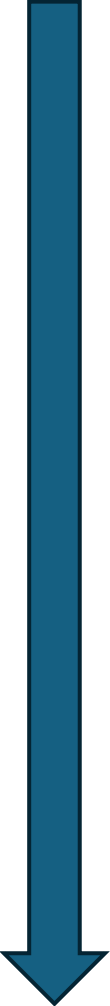
Each project involved::

- developing databases in the context of specific projects
- developing data models to both reflect domains and support real-world usage
- using existing data of various forms
- processing/conversion/editing/cleanup of data
- creating apps (interfaces) to enable *inclusive* access, use, and interaction

# Locations of communities/ projects



# Gamilaraay data over 30 years

- 
- manuscript and other resources from past researchers and documenters
  - FileMaker database (dubious data model)
  - database data exported to QuarkXPress structured word processing document
  - book designer made many manual edits to QuarkXPress document
  - book dictionary published
  - Quark files exported, converted to XML, XML/XSLT tools to clean up document
  - XML files processed and exported to structured data
  - data imported into app authoring program (Director)
  - develop storyboards and build language learning app (Gayarragi Winangali)
  - app data exported, checked, corrected, updated
  - design data model, implement SQL database and import data
  - develop software for dictionary app projecting SQL database for user interaction
  - process sentence data, extend database and Gaman app to develop embedded concordance
  - build dictionary editor WYSIWYG app enabling community use in language revitalisation

## Manuscripts & books

|                   |                                  |                              |                                       |                      |                               |  |  |
|-------------------|----------------------------------|------------------------------|---------------------------------------|----------------------|-------------------------------|--|--|
| 82                |                                  |                              |                                       | TERRUBUL—VOCABULARY. |                               |  |  |
| wife              | { mirru<br>(dual) mirrūy         | grandmother                  | (kumiŋun)                             | girl                 | kīn, yurumkun                 |  |  |
| brother           | { ḡubbuḡa, ābāy,<br>(wuntjimun)  | little girl                  | killalān                              | boy                  | { mualum,<br>(dūandin, buiyīr |  |  |
| brother (younger) | duaqal                           | baby                         | mōalam                                | young man            | kippa                         |  |  |
| sister            | dāddi,muḡuḡkul                   | full man                     | mutta                                 |                      |                               |  |  |
| friend (comrade)  | uūḡun                            |                              |                                       |                      |                               |  |  |
| grandfather       | (yuguūpin)                       |                              |                                       |                      |                               |  |  |
| 4. ANIMALS—Daoūn. |                                  |                              |                                       |                      |                               |  |  |
| bird              | mirrūn,daoūpin                   | flies                        | dūdunburra                            | jackass bird         | kakōwan                       |  |  |
| bream             | ḡullun                           | kangaroo                     | (murri)                               |                      |                               |  |  |
| butterfly         | bālūmbir                         | kangaroo (old)               | kurūman,                              |                      |                               |  |  |
| catfish           | ḡāmerikurra                      | man)                         | ḡrūman                                |                      |                               |  |  |
| cockatoo          | kaiyar                           | locust                       | dinpīr                                |                      |                               |  |  |
| black cockatoo    | karara, karēr                    | mosquito                     | tībīy                                 |                      |                               |  |  |
| cock of wood      | kao-al                           | mussel                       | būkkaoa                               |                      |                               |  |  |
| crow              | wowul, wowa                      | mussel (large and beautiful) | dūllin                                |                      |                               |  |  |
| dog               | mēyē, mirri                      | opossum                      | kubbi                                 |                      |                               |  |  |
| dog (wild)        | ḡulḡul                           | pelican                      | bulualum (ḡirriḡ)                     |                      |                               |  |  |
| duck              | ḡa, nar                          | sea pigs                     | yūḡun                                 |                      |                               |  |  |
| eagle             | dibbil (būdhār)                  | shark                        | poi                                   |                      |                               |  |  |
| eel               | tāḡun                            | snake                        | { kābul, buī, yūun,<br>(yūwuy, wuḡai) |                      |                               |  |  |
| emu               | ḡuyi (ḡurun)                     | whales                       | tālūbilla                             |                      |                               |  |  |
| fish              | { ḡandakul,<br>(kuiyur (ḡundaya) |                              |                                       |                      |                               |  |  |



## Database tables (“FileMaker Pro”)

-aaba-li,m1

-araay,m2

-awaa,m3

-ayla-y,m4

-Baa,m5

baa,m6

baa-y,m7

baabi-li,m8

baada-li,m9

baadal,m10

baadhal,m11

baadi,m12

baadjin,m13

baagii,m14

baalaraan,m15

baaldharradharra,m16

baaluu,m17

baama,m18

baamagaaliyan,m19

|       |    |   |   |   |
|-------|----|---|---|---|
| 6145  | 1  | 0 |   | 0 |
| 9428  | 2  | 0 |   | 0 |
| 4338  | 3  | 0 |   | 0 |
| 9747  | 4  | 0 |   | 0 |
| 6498  | 5  | 0 |   | 0 |
| 2590  | 6  | 0 | a | 0 |
| 10966 | 6  | 0 | b | 0 |
| 6250  | 7  | 0 | a | 0 |
| 6251  | 7  | 0 | b | 0 |
| 10984 | 7  | 0 | c | 0 |
| 3647  | 8  | 0 |   | 0 |
| 9717  | 9  | 0 |   | 0 |
| 108   | 10 | 0 | a | 0 |
| 109   | 10 | 0 | b | 0 |
| 16597 | 11 | 0 |   | 1 |
| 7010  | 11 | 0 |   | 2 |
| 3432  | 12 | 0 | a | 0 |
| 10973 | 12 | 0 | b | 0 |
| 86    | 13 | 0 |   | 0 |

## “Quark Express” layout program -> published book

### -Baa (YR, YY, GR) suffix

1 time of. Occurs in yaay-baa (sun-baa) meaning ‘summer’ and dhandarr-aa (frost-aa) meaning ‘winter’.

2 place of. Occurs in walaay-baa (camp-place of) meaning ‘a person’s country or home place’.

◆ Gayaay-baa-ga ngiyani yanaa-waa-nha. (YR) We are walking through a sandy place. □ This suffix is attached to nouns; overall it conveys a meaning something like English ‘context’. Some uses of -baa are not fully understood. Sometimes used to form adjectives, as in dhalay-baa (sharp) from dhalay (tongue), and gurru-baa (deep) from gurru (hole). Variant form is -aa. See Learner’s Guide.

### baa (YY) noun

hip. One source.

### baa-y (YR, YY) verb-intransitive

1 hop (YR, YY). ◆ Giirr nhama bunbun baa-nhi maayama-ga. (YR) The grasshopper hopped over the stone.

2 jump (YR, YY). ◆ Nhama bandaarr-giirr baa-y-la-nha. (YR) He’s jumping like a kangaroo.

3 stamp (YR). ◆ Giirr ngiyama baa-y-la-nhi manduwii-dhalibaa dhayn-galgaa. (YR) The men were stamping without any boots on.

4 flap (YR). ◆ Giirr gudu baa-y-la-nhi ngiyarra ganuu-ga. (YR) The fish were flapping in the canoe.

### baabi-li (YR, YY, GR) verb-intransitive

1 stay (YR, YY, GR). ◆ Minyaaya-nda baabi-li? (GR) Where will you stay?

2 sleep (YR, YY, GR). ◆ Ngurray yarral-a baabi-la-nha. (GR) A black snake is sleeping on the stone.

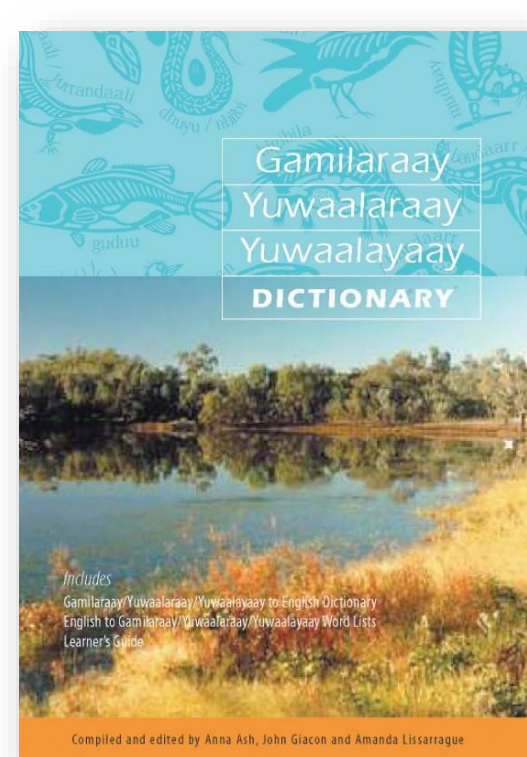
3 camp (GR). □ This is a rare word in YY and YR. There is limited evidence for a related form baaba-y (sleep).

### baada-li (YY) verb-transitive

comb (hair). One source.

### baadal (YY) noun

comb. Related to baada-li (comb hair). One source. Originally a nit comb, made from a piece of bone or wood.



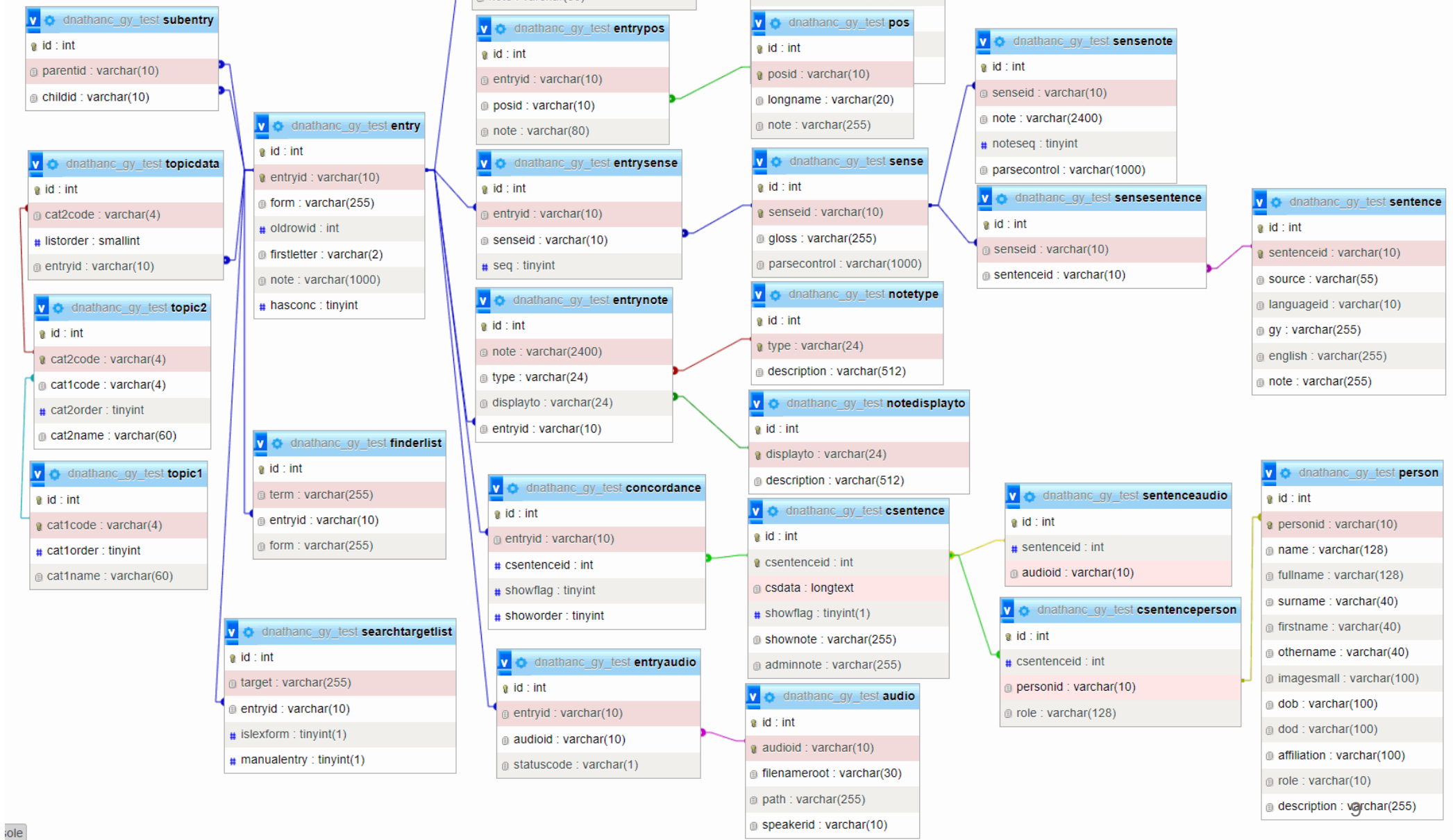
## Quark document exported as RTF

- {\rtlch\af12 -Baa {\rtlch (YR, YY, GR) {\rtlch\af11 suffix} \par \pard\plain \li226 1 {\fs18 time of. {\cs19 Occurs in {\rtlch\af11 yaay-baa {\cs19 (sun-baa) meaning \u8216\91summer\u8217\92 and {\rtlch\af11 dhandarr-aa {\cs19 (frost-aa) meaning \u8216\91winter\u8217\92.} \par \pard\plain \li226 2 {\fs18 place of. {\cs19 Occurs in {\rtlch\af11 walaay-baa {\cs19 (camp-place of) meaning \u8216\91a person\u8217\92s country or home place\u8217\92. {\rtlch\af9 \u61557\3f\u61472\3f {\rtlch\af11 Gayaay-baa-ga ngiyani yanaa-waa-nha. {\rtlch (YR) {\cs18\fs18 We are walking through a sandy place. {\cs19 } \par \pard\plain This suffix is attached to nouns; overall it conveys a meaning something like English \u8216\91context\u8217\92. Some uses of {\rtlch\af11 -baa {\cs19 are not fully understood. Sometimes used to form adjectives, as in {\rtlch\af11 dhalay-baa {\cs19 (sharp) from {\rtlch\af11 dhalay {\cs19 (tongue), and {\rtlch\af11 gurru-baa {\cs19 (deep) from {\rtlch\af11 gurru {\cs19 (hole). Variant form is {\rtlch\af11 -aa {\cs19 . See Learner\u8217\92s Guide.} \par \pard\plain {\cs16 baa {\rtlch (YY) {\rtlch\af11 noun} 1 {\fs18 hop {\rtlch (YR, YY). {\rtlch\af9 \u61557\3f {\rtlch\af11 Giirr nhama bunbun baa-nhi maayama-ga. {\rtlch (YR) {\cs18\fs18 The grasshopper hopped over the stone.} \par \pard\plain \li226 2 {\fs18 jump {\cs19 {\rtlch (YR, YY). {\rtlch\af9 \u61557\3f {\rtlch\af11 Nhama bandaarr-giirr baa-y-la-nha. {\rtlch (YR) {\cs18\fs18 He\u8217\92s jumping like a kangaroo. } \par \pard\plain \li226 3 {\fs18 stamp {\rtlch (YR). {\rtlch\af9 \u61557\3f {\rtlch\af11 Giirr ngiyama baa-y-la-nhi manduwii-dhalibaa dhayn-galgaa. {\rtlch (YR) {\cs18\fs18 The men were stamping without any boots on.} \par \pard\plain \li226 4 {\fs18 flap {\rtlch (YR). {\rtlch\af9 \u61557\3f {\rtlch\af11 Giirr gudu baa-y-la-nhi ngiyarrma ganuu-ga. {\rtlch (YR) {\cs18\fs18 The fish were flapping in the canoe.} \par \pard\plain {\cs16 baabi-li {\rtlch (YR, YY, GR) {\rtlch\af11 verb-intransitive} \par \pard\plain \li226 1 {\fs18 stay {\rtlch (YR, YY, GR). {\rtlch\af9 \u61557\3f {\rtlch\af11 Minyaaya-nda baabi-li? {\rtlch (GR) {\cs18\fs18 Where will you stay?} \par \pard\plain \li226 2 {\fs18 sleep {\rtlch (YR, YY, GR). {\rtlch\af9 \u61557\3f {\rtlch\af11 Ngurray yarral-a baabi-la-nha. {\rtlch (GR) {\cs18\fs18 A black snake is sleeping on the stone.} \par \pard\plain \li226 3 {\fs18 camp {\rtlch (GR).} \par \pard\plain This is a rare word in YY and YR. There is limited evidence for a related form } \par \pard\plain baaba-y {\cs19 (sleep).} \par \pard\plain {\cs16 baada-li {\rtlch (YY) {\rtlch\af11 verb-transitive} \par \pard\plain comb (hair). {\cs19 One source.} \par \pard\plain {\cs16 baadal {\rtlch (YY) {\rtlch\af11 noun} \par \pard\plain comb. Related to {\rtlch\af11 \ltrch\hich\af11\fs18\af11 baada-li {\fs18 (comb hair). {\cs19 One source. Originally a nit comb, made from a piece of bone or wood.}

RTF parsed (by Regex and manually) and developed into XML document

```
<entry><id>1</id><form>-aaba-li</form>
<languages>YR, YY</languages>
<pos>suffix</pos>
<poly0>0</poly0>
<gloss0>all</gloss0>
<sent>Giirr nhama maadhaay-u dhingгаа dha-l-
aaba-y.</sent>
<languages>YR</languages>
<sentgloss>The dog ate all the meat.</sentgloss>
<sent>Giirruu ngaama ganunga birralii-gal banaga-
w-aaba-lda-nhi.</sent>
<languages>YR</languages>
<sentgloss>All the boys (they) ran
away.</sentgloss>
<com1>The completive suffix is attached to verbs
to indicate that the action is being done 'to all' or
'by all'.
<xguide>See Learner's Guide</xguide>
</entry>
```

SQL (relational/tabular) database designed;  
XML processed and imported into tables



# Gaman dictionary & editor

## Processed data



-Dhuul  *suŋ* GR, YR, YY 

1. **little, small**

*Buma-la nhama birralii-djuul.* YR  
Hit that little child.

*Milan-duul ngali bayama-y dhagaay.* YR  
We caught one little perch.

2. **one**

dhuuraay  *n* GR

1. **flame**

2. **light**

dhuurran  *adj* YY

1. **knowledgeable**

dhuurranmay  *n* GR, YR, YY

1. **leader, chief, boss**

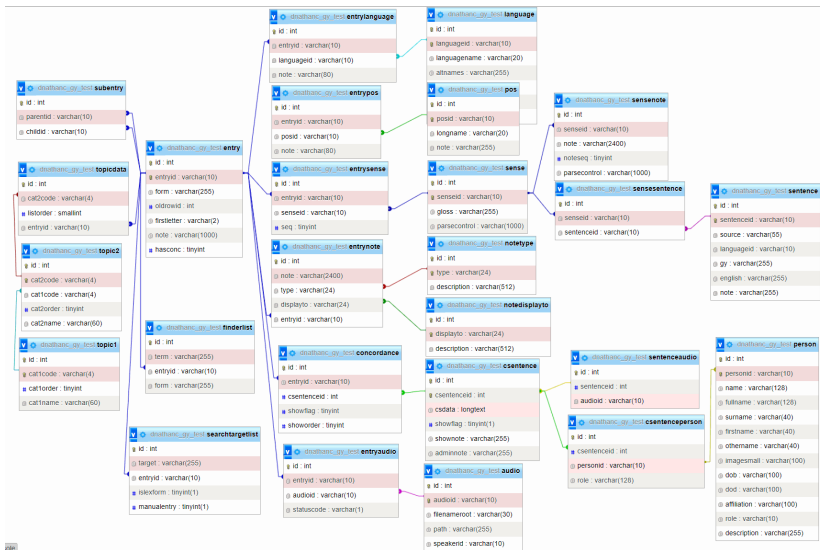
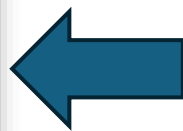
- The top man; top of its group or kind. can be applied to any group of things.

Ted Fields (speaker) said they lead the corroboree and hunting party.

dhuurranmay waa  *n* YY

1. **boss shell**

- Believed to be the 'alligator' shell, that is, a piece of Garriya's egg, made into a pendant and worn by the 'top men'. From dhuurranmay (chief, leader) and waa (shell).



DHual

MODIFY



surf

MODIFY

GR, YR, YY

MODIFY

+ SENSE

11 SENSES

MAIN/SUB

+ ENTRY NOTE

DELETE ENTRY

[1] little, small

MODIFY

DELETE

+ NOTE

11 NOTES

+ SENTENCE

*Buma-la nhama birralii-djuul.*

YR

DELETE

Hit that little child.

*Milan-duul ngali bayama-y dhagaay.*

YR

DELETE

We caught one little perch.

[2] one

MODIFY

DELETE

+ NOTE

11 NOTES

+ SENTENCE

Show topics

## Dictionary

## Database

## Editor

## Gaman database editor

- enables maintenance, updating and editing the dictionary data
- WYSIWYG (“what you see is what you get”) as much as possible
- for community members - not needing specialist linguistic or IT skills
- implements user logins, levels and permissions/capabilities
- provides contextual information and feedback to users
- enables easy building of links to internal and external resources
- constantly works in the background to protect data integrity

[Editor](#)

## Dictionary entry for 'bandaarr'

**bandaarr**  *n* GR, YR, YY 

1. **grey kangaroo** *Macropus giganteus* (→W) (→EOL) (→ALA)

- This is the eastern-grey kangaroo; it was eaten but the red kangaroo was preferred. Also the name of an unidentified star. Now the common word for 'kangaroo'.

*Bandaarr bilaa-yu nhama ngaya dhu-nhi.* GR

I speared the kangaroo.

**Bandaarra**  *pln* GR

1. **Bundarra**

- A town west of Armidale. From bandaarr (grey kangaroo) and probably -aa (place of).

## Creating links with ‘smart blocks’:

The dictionary displays the gloss for [bandaarr](#) as:

grey kangaroo *Macropus giganteus* ([→W](#)) ([→EOL](#)) ([→ALA](#))

The species information has been encoded and stored in the database as:

```
<Macropus giganteus></tax Macropus giganteus>
```

The dictionary app creates custom web search links for ‘Macropus giganteus’ to each of these major sources of further information:

- Wikipedia (“W”)
- Smithsonian’s Encyclopedia of Life (“EOL”)
- Atlas of Living Australia (“ALA”)

The user creates these links [using the editor](#).

[Select entry](#) | [Create entry](#) | [Re-index search list](#) | [View log](#)

**bandaarr** (m109) has 1 subentry: **Bandaarra**

**bandaarr** (m109) is shown below. [Start editing](#)

**bandaarr**  *n* GR, YR, YY

[1] grey kangaroo *Macropus giganteus* ( →W ) ( →EOL ) ( →ALA ) [grey kangaroo  
<Macropus giganteus></tax Macropus giganteus>]

- This is the eastern-grey kangaroo; it was eaten but the red kangaroo was preferred. Also the name of an unidentified star. Now the common word for 'kangaroo'.

*Bandaarr bilaa-yu nhama ngaya dhu-nhi.* GR  
I speared the kangaroo.

[Select entry](#) | [Create entry](#) | [Re-index search list](#) | [View log](#)

**bandaarr** (m109) has 1 subentry: **Bandaarra**

**bandaarr** (m109) is shown below. [Stop editing](#)

**bandaarr** [MODIFY](#)  *n* [MODIFY](#) GR, YR, YY [MODIFY](#)

[+ SENSE](#) [↕ SENSES](#) [MAIN/SUB](#) [+ ENTRY NOTE](#) [DELETE ENTRY](#)

[1] grey kangaroo *Macropus giganteus* ( [→W](#) ) ( [→EOL](#) ) ( [→ALA](#) ) [grey kangaroo  
<Macropus giganteus></tax Macropus giganteus>] [MODIFY](#) [DELETE](#) [+ NOTE](#) [↕ NOTES](#)  
[+ SENTENCE](#)

■ This is the eastern-grey kangaroo; it was eaten but the red kangaroo was preferred. Also the name of an unidentified star. Now the common word for 'kangaroo'. [MODIFY](#) [DELETE](#)

*Bandaarr bilaa-yu nhama ngaya dhu-nhi.* GR [DELETE](#)  
I speared the kangaroo.

Update sense "grey kangaroo " (186) of **bandaarr** (m109) (n, GR, YR, YY) "grey kangaroo "



Sense:

grey kangaroo <Macropus giganteus></tax Macropus giganteus>

Smartblocks:

Open

Close

Smartblock will be inserted at cursor, or will replace a selection

Don't modify smartblock here

- to modify a smartblock, create and save the note, then modify it

For plain language content, surround with angle brackets, e.g. <gaba>

Select smartblock type:

Latin term



Select

Binomial (scientific/Latin) name

Macropus giganteus

Insert smartblock into sense

Check

Update now

Close

# Gupapuyngu

- language teaching and learning app for Gupapuyngu, one of the Yolngu languages (NE Arnhem Land, Australia)
- in conjunction with Charles Darwin University
- for graduate and distance learning classes
- first developed as a multimedia CD-ROM, now redeveloped as web-based app

[see site](#)

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Learn Gupapuyngu grammar

PRONOUNS SUFFIXES VERBS DEMONS ROOTS

nhanukala occurs in 2 sentences

Yalala narra dhu gäma bala wägalili **nhanukala**.  
Nali dhu **nhanukala** wägarura nhina.

|              | (nom)   | -gu        | -gala        | -wuy            | -gungu        | -nha       |
|--------------|---------|------------|--------------|-----------------|---------------|------------|
| I            | narra   | narraku    | narrakala    | narrakalawuy    | narrakungu    | narranha   |
| you (sg)     | nhe     | nhuru      | nhokala      | nhokalawuy      | nhokungu      | nhuna      |
| he, she, it  | gayi    | nhanju     | nhanukala    | nhanukalawuy    | nhanukungu    | ganya      |
| we (2_incl)  | gali    | litjangu   | litjalangala | litjalangalawuy | litjalangungu | litjalanha |
| we (2_excl)  | linyu   | linyalangu | linyalangala | linyalangalawuy | linyalangungu | linyalanha |
| they (2)     | magda   | magdangu   | magdangala   | magdangalawuy   | magdangungu   | magdanha   |
| we (pl_incl) | limurru | limurrungu | limurrungala | limurrungalawuy | limurrungungu | limurrunha |
| we (pl_excl) | napurru | napurrungu | napurrungala | napurrungalawuy | napurrungungu | napurrunha |
| you (pl)     | nhuma   | nhumalangu | nhumalangala | nhumalangalawuy | nhumalangungu | nhumalanha |
| they         | walala  | walalangu  | walalangala  | walalangalawuy  | walalangungu  | walalanha  |

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Gupapuyngu grammar exercises

Multiple choice, grammar type: Pronouns

S204: Walalangu **wanha** wakupulu wäja?

Where did your waku take them?

What did you waku say?

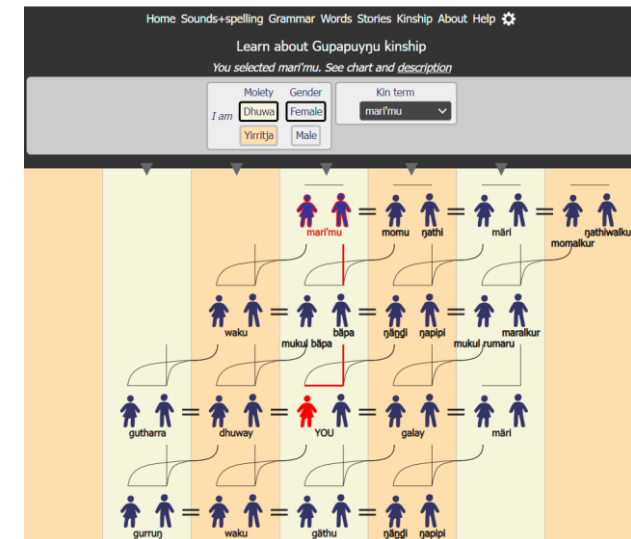
Where is their waku clan's place?

What did your waku ask for?

CHECK ANSWER

SKIP

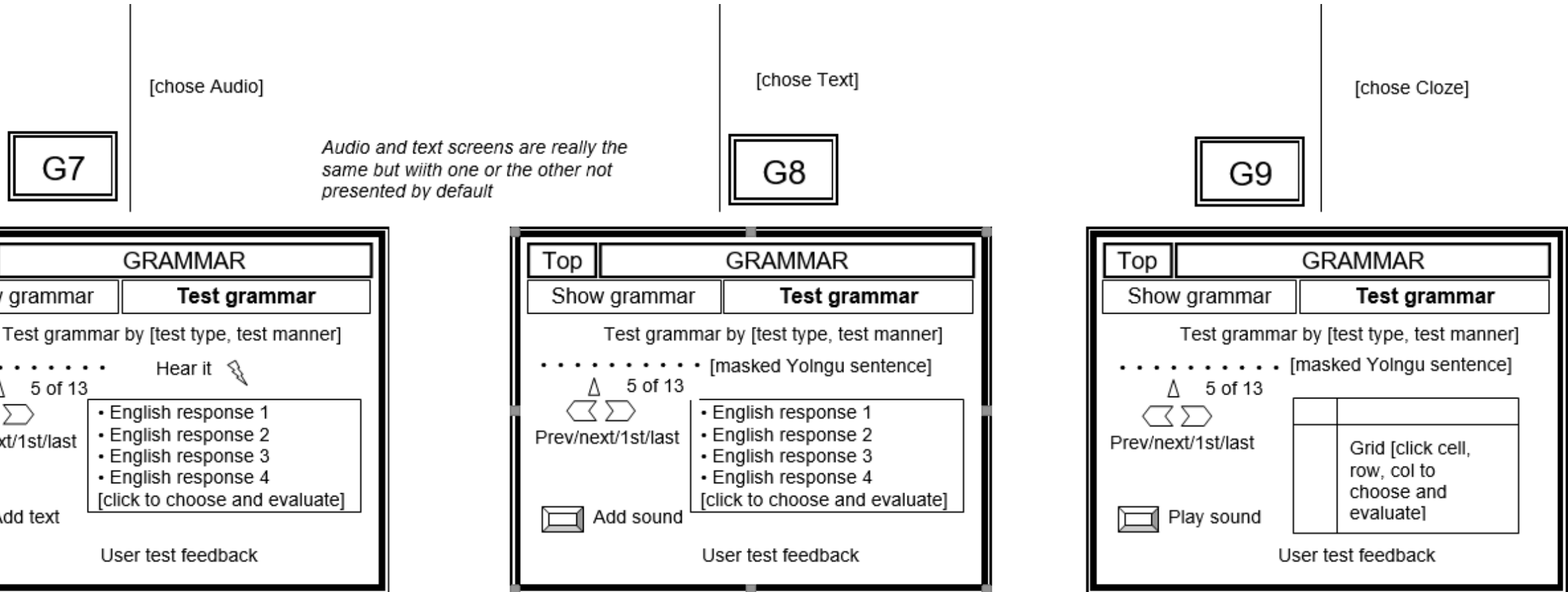
Question 1 of 10  
Score so far: 0



# Data initially developed from learners' wordlists

| seqID | oldID | form       | gloss                                 | package   | SOUND<br>FILE | VOCAB<br>LIST | sortform    | KinTerm |
|-------|-------|------------|---------------------------------------|-----------|---------------|---------------|-------------|---------|
| 1     | 3     | bala       | <i>away from the speaker,<br>then</i> | P50R18C1  | 111           | 10            | bala        |         |
| 2     | 5     | bala\u     | <i>on the way there</i>               | P50R19C1  |               | 12            | bala'nzu    |         |
| 3     | 6     | Balanda    | <i>European</i>                       | P50R21C1  | 2             | 1             | Balanda     |         |
| 4     | 4     | Bala'      | male dhuwa subsection                 | P50R20C1  | 1             | M             | Balanz'     |         |
| 5     | 7     | baman'     | <i>long ago</i>                       | P50R22C1  | 112           | 10            | baman'      |         |
| 6     | 576   | Bāniyala   | place name                            | P50R158C1 |               |               | Bāniyalaa   |         |
| 7     | 1     | Ba\ə[i     | male yirritja subsection              | P50R16C1  |               | M             | Banzadi     |         |
| 8     | 2     | Ba\ə[itjan | female yirritja subsection            | P50R17C1  |               | M             | Banzaditjan |         |
| 9     | 8     | bāpa       | <i>father</i>                         | P50R23C1  |               | G             | bāpa        | -1      |
| 10    | 9     | bāpurru    | <i>clan group, funeral</i>            | P50R24C1  | 3             | 3             | bāpurru     |         |
| 11    | 10    | barpuru    | <i>yesterday, recently</i>            | P50R25C1  | 4             | 10            | barpuru     |         |
| 12    | 11    | barrari    | <i>frightened</i> Vintr-II            | P10R17C2  |               | 9             | barrari     |         |
| 13    | 12    | barrarina  | <i>frightened</i> Vintr-III           | P10R17C3  |               | 9             | barrarina   |         |
| 14    | 13    | barrarinya | <i>frightened</i> Vintr-IV            | P10R17C4  |               | 9             | barrarinya  |         |
| 15    | 14    | barrarirri | <i>frightened</i> Vintr-I             | P10R17C1  | 5             | 9             | barrarirri  |         |
| 16    | 15    | bāru       | <i>crocodile</i>                      | P50R26C1  | 113           | 12            | bāru        |         |
| 17    | 16    | bathan     | <i>cook</i> Vtr-I                     | P10R27C1  | 6             | 9             | bathan      |         |
| 18    | 17    | bathana    | <i>cook</i> Vtr-IV                    | P10R28C4  |               | 9             | bathana     |         |
| 19    | 18    | bathara    | <i>cook</i> Vtr-III                   | P10R28C3  |               | 9             | bathara     |         |

# Storyboards: bridge between data and app



[see site](#)

# Web app: data stored in multiple JSON files

```
[{
  "lexid": "1",
  "exid": "MC1",
  "audio": "001.mp3",
  "options": ["bakpak", "bagpag", "bakupak", "bakupaku"]
}, {
  "lexid": "2",
  "exid": "MC2",
  "audio": "002.mp3",
  "options": ["balanda", "balandha", "barranda", "baranda"]
}, {
  "lexid": "3",
  "exid": "MC3",
  "audio": "003.mp3",
  "options": ["baman", "bamany", "bamanh", "bamanḡ"]
}, {
  "lexid": "4",
  "exid": "MC4",
  "audio": "004.mp3",
  "options": ["banikin", "banyikin", "banḡikin", "banikinḡ"]
}, {
  "lexid": "5",
  "exid": "MC5",
  "audio": "005.mp3",
  "options": ["bäpa", "bäba", "bapa", "bäpaḡ"]
}, {
  "lexid": "6",
  "exid": "MC6",
  "audio": "006.mp3",
```

```
{
  "rows": [
    [
      ["P30R0C0", ""],
      ["P30R0C1", "(nom)"],
      ["P30R0C2", "-gu"],
      ["P30R0C3", "-gala"],
      ["P30R0C4", "-wuy"],
      ["P30R0C5", "-guḡu"],
      ["P30R0C6", "-nha"]
    ],
    [
      ["P30R1C0", "I"],
      ["P30R1C1", "ḡarra"],
      ["P30R1C2", "ḡarraku"],
      ["P30R1C3", "ḡarrakala"],
      ["P30R1C4", "ḡarrakalaḡawuy"],
      ["P30R1C5", "ḡarrakuḡu"],
      ["P30R1C6", "ḡarranha"]
    ],
    [
      ["P30R2C0", "you (sg)"],
      ["P30R2C1", "nhe"],
      ["P30R2C2", "nhuḡu"],
      ["P30R2C3", "nhokala"],
      ["P30R2C4", "nhokalaḡawuy"],
      ["P30R2C5", "nhokuḡu"],
      ["P30R2C6", "nhuna"]
    ]
  ],
}
```

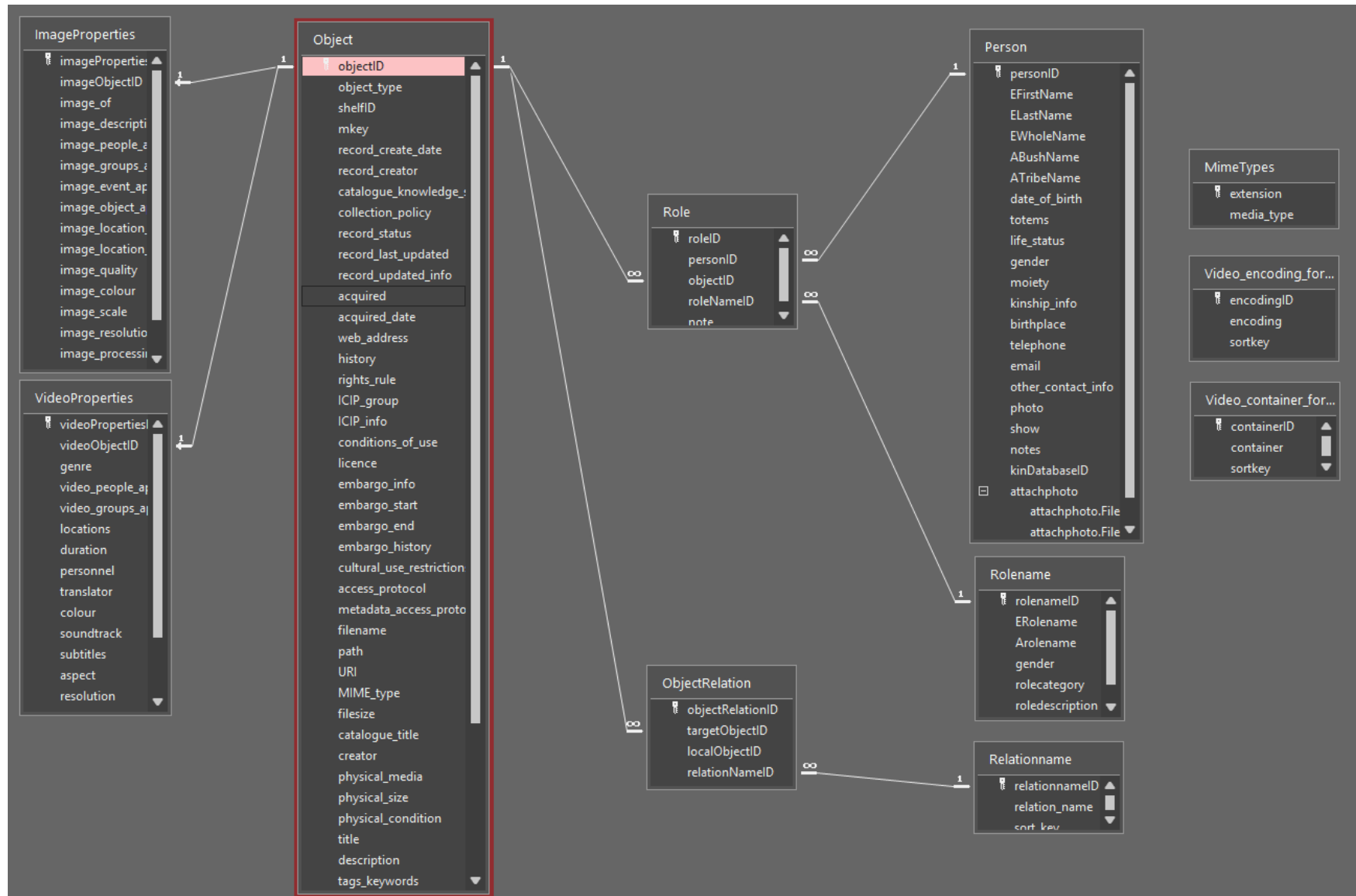
[see site](#)

# Ajamurnda: Anindilyakwa (Groote Eylandt)

- digital archive for language and community resources
- based on collection of ~230,000 digital files collected from many computers
- deduplicated, curated, processed, to ~50,000 files
- emphasis on collecting, extracting and storing metadata
- developed metadata set based on IRCA (Indigenous Remote Communications Association) standard plus local factors
- researched and developed protocol system for access management
- created database application for cataloguing, search etc

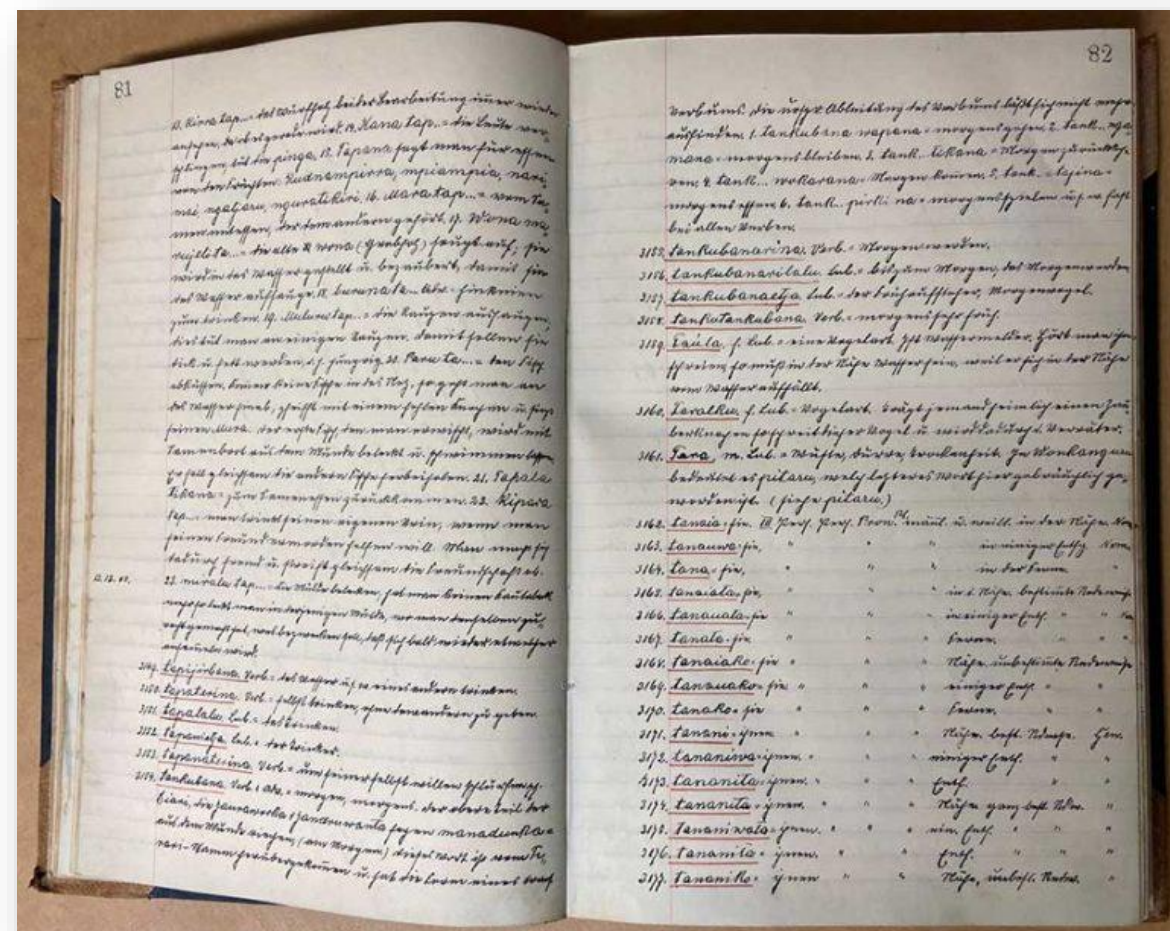
The screenshot displays the Ajamurnda database application interface. At the top, the title 'AJAMURNDA' is visible. Below it, the record ID is '5', with a dropdown menu and a 'Copy Miromaa key' button. The 'M00005' key is shown next to an 'image' label. The main form contains fields for 'Filename' (PH0001.tif), 'File path' (K:\library\0002\), and 'Shelf ID' (PH0001). To the right of these fields is a large green rectangular area, likely a placeholder for an image, with a 'VIEW' button. Below the form, there are tabs for 'This record', 'Object', 'People & roles', 'People depicted', 'Culture & ICIP', 'Rights', 'Access', and 'Image'. The 'This record' tab is active, showing a section titled 'All information below is about this catalogue record'. This section includes fields for 'Create date' (23/12/2012), 'Last updated' (18/05/2017), 'Collection policy?' (no), 'Update info', and 'Completion status' (Complete). Below this, there are two sections for adding people: 'Which person created this record?' and 'Which people provided the information about this record's object?'. Both sections have a text input field containing 'Melainie Collins, b 1982' and an 'Add person' button. The bottom of the interface features a navigation bar with icons for back, forward, search, and other functions, along with a '+ Object' button and a 'Save' button.

# Ajamurda database schema



# Diyari (Dieri) – Reuther manuscripts

- incremental digitisation and markup of 1,000 page encyclopedic dictionary over decades by multiple linguists
- converted to XML and made “machine-readable”
- incremental enrichment of XML and production of dictionaries (Peter Austin & Ed Garrett)



## Transcribed and partial, non-standard markup

42. #buru\$ (n) = 'corner; end; edge of a boundary; side', e.g.

1) #punga burru\$ = 'corner of a house or hut', e.g. #punga burruni kandri manila wapau!\$ = 'go, fetch

In both instances Reuther wrote #bunga\$. His almost consistent spelling elsewhere, however, is #punga\$, which I have adopted here. P.A.S.

{p57}<I,40>

the weapon (#kandri\$ = fighting boomerang) from the end of the house'

2) #pantu burru\$ = 'end, shore, or edge of a lake', e.g. #pantu burruni karitjiau!\$ = 'go around the ends etc. of the lake'

3) #pirra burru\$ = 'side of a wooden dish', e.g. bra #burruni wilpa kulno nganai\$ = 'there is a hole in the side of the dish'

4) #billi burru\$ = 'corner of a string-bag', e.g. #billi burruni mura ngakani parai\$ = 'in the corner of the string- bag lies my #mura\$ 'sacred stone' [or "churinga"]].

5) #talara billi burru\$ = 'fringe of a strip of rain', e.g. #talara billi burru nauja ngariji\$ = 'a strip of rain is falling (it is raining) at the fringe.'

{\fn2}<I,41>

6) #mandra burru\$ = 'side of the stomach or belly'

7) #Kunari burru\$ = 'end of the Cooper's Creek', i.e. the place where the territorial boundary finishes for one of the local tribes, e.g. in Kintalamanku the boundary of the Diari tribe ends. Up to this point the Cooper is known as Kunari, but from there onward it is called Ngaraua 'salty').

8) #burru\$ = 'end of a piece of wood'

## Converted to XML (using Regex, scripts, manual)

<entry lbl="42" num="42" suf="">

<lemma>

<di>buru</di>

<pos val="n"/>

</lemma>

<gloss>corner, end, edge of a boundary, side</gloss>

<sub>

<subnum num="1"/>

<di>punga burru</di>

<free>corner of a house or hut</free><eg><di>punga burruni kandri m

<free>go, fetch the weapon (<di>kandri</di>

<gloss>fighting boomerang</gloss>) from the end of the house</fr

</sub>

<location>

<page num="p57"/>

<reuther vol="I" page="3"/>

</location>

<sub>

<subnum num="2"/>

<di>pantu burru</di>

<free>end of a lake, shore of a lake, edge of a lake</free><eg><di>par  
around the ends etc. of the lake</free></eg>

</sub>

<sub>

<subnum num="3"/>

<di>pirra burru</di>

<free>side of a wooden dish</free><eg><di>bira burruni4wilpa kulno  
nganai</di><free>there is a hole in the side of the dish</free></eg>



Data enriched manually  
(Peter Austin)



Web app (Ed Garrett)

[see entry](#)

**buru** n. corner, end, edge of a boundary, side

Spelling: purru

Context: The Tirari and Kujani say:

wapu

Mythology: This word originated from the **muramura Darana**. When, in his day, he begged for rain, a bud came up, and before long he [could] observe strips of rain that kept on spreading out. These he named **billi burru**.

[1] **punga burru** corner of a house or hut

**punga burruni kandri manila wapau!**

go, fetch the weapon ('kandri' (fighting boomerang)) from the end of the house

[2] **pantu burru** end of a lake, shore of a lake, edge of a lake

**pantu burruni karitjiau!**

go around the ends etc. of the lake

[3] **pirra burru** side of a wooden dish

**bira burruni wilpa kulno nganai**

there is a hole in the side of the dish

[4] **billi burru** corner of a string-bag

**billi burruni mura ngakani parai**

in the corner of the string-bag lies my 'mura' sacred stone [or "churinga"]

[5] **talara billi burru** fringe of a strip of rain

**talara billi burru nauja ngariji**

a strip of rain is falling

Context: it is raining at the fringe.

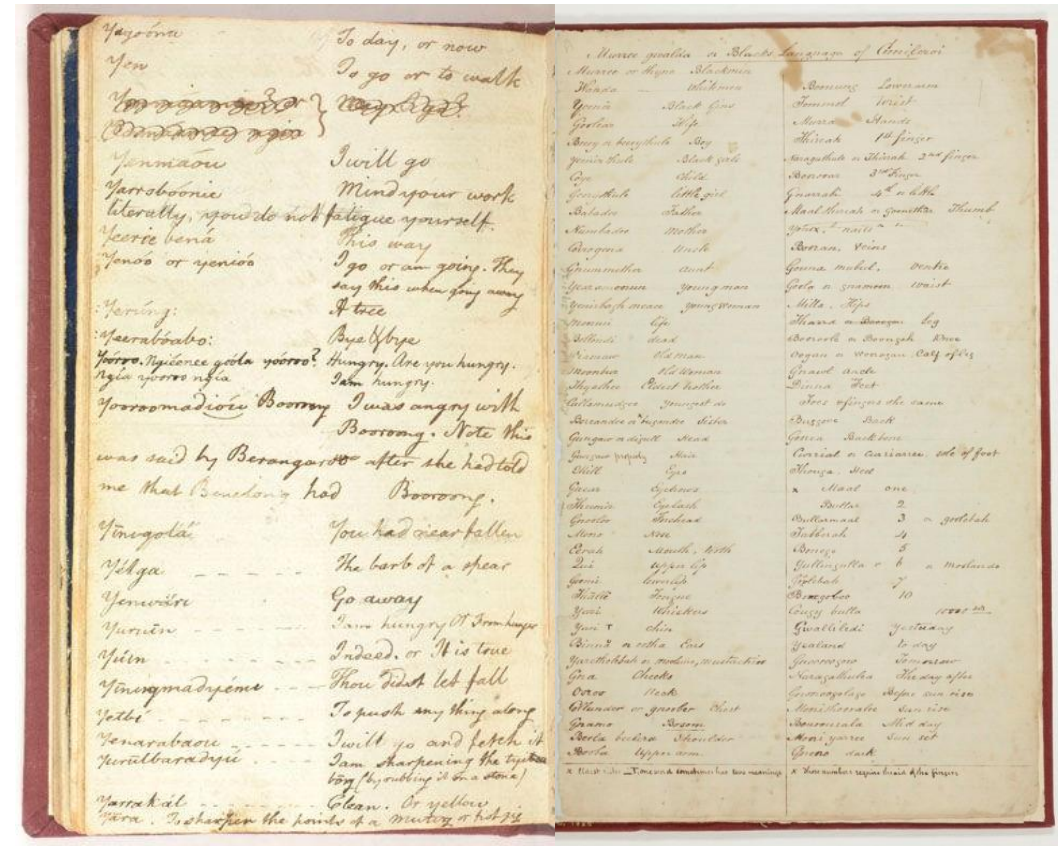
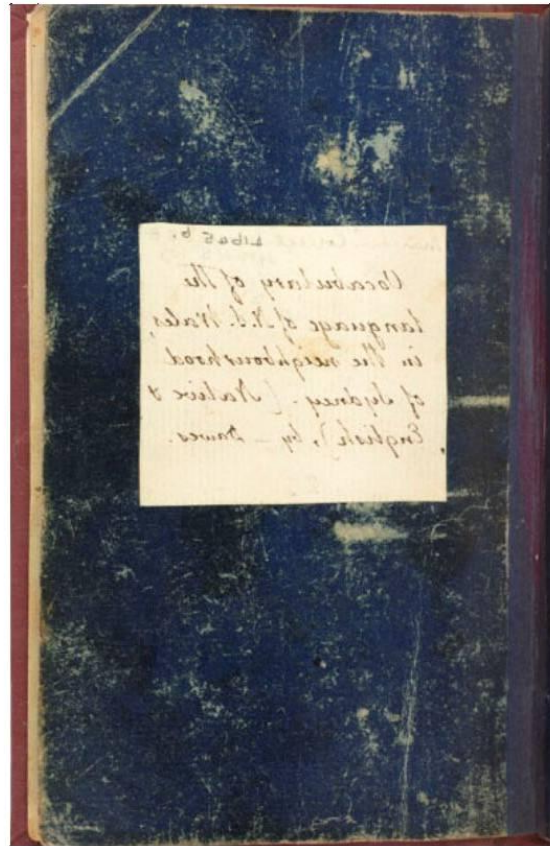
[6] **mandra burru** side of the stomach or belly

[7] **Kunari burru** end of Cooper Creek

Ethnography: i.e. the place where the territorial boundary finishes for one of the local tribes, e.g. in **Kintalamanku** the boundary of the Diari tribe ends. Up to this point the Cooper is known as **Kunari**, but from there onward it is called **Ngaraua** salty.

[8] **burru** end of a piece of wood

# The Notebooks of *William Dawes' Notebooks on the Aboriginal Language of Sydney*



Developed to provide access to *William Dawes' Notebooks on the Aboriginal Language of Sydney, 1790-1791*

The text was newly transcribed, then marked up using special XML schema 'Topic Maps'.

Types and numbers of files (all XML plain text except images):

- notebook pages: 131
- grammatical info: 130
- notes: 20426
- web (HTML, CSS, PHP): 22
- images: 302

Uses these technologies:

- XML, XSL, TEI (Text Encoding Initiative), Topic Maps, HTML/CSS/PHP

## XML (book A, page 18)

```

<pb n="18" xml:id="d1e6572"/> <head
xml:id="d1e6574">Other <choice xml:id="d1e6576">
<orig xml:id="d1e6577">inflexions</orig><reg
xml:id="d1e6579">inflections</reg></choice> <abbr
xml:id="d1e6582"><choice xml:id="d1e6583"><am
xml:id="d1e6584">&lt;/am><ex
xml:id="d1e6586">et</ex></choice>c.</abbr></head>
<div type="_glosslist" xml:id="d1e6590">          <p
xml:id="d1e6592"><seg type="_leftcol"
xml:id="d1e6593"><foreign xml:id="d1e6594"><w
xml:id="banganabye"
sameAs="#bangabanie">Bangabánye</w></foreign></s
eg>          <seg type="_rightcol"
xml:id="d1e6598"><note type="_glossnote"
resp="#person.dawes" target="#banganabye"
xml:id="d1e6599">I think a future of <orig
xml:id="d1e6601"><lb xml:id="d1e6602"/></orig>some
other          person.</note></seg></p>          <p
xml:id="d1e6605"><seg type="_leftcol"
rend="css(border-bottom:1pt solid;)"
xml:id="d1e6606"><foreign xml:id="d1e6607"><w
lemmaRef="#banga" ana="#BANGADARA"

```

## XML (example popup note/concordance)

```

<?xml version="1.0" encoding="UTF-8"?><TEI
xmlns="http://www.tei-c.org/ns/1.0" xml:id="note-
d1e11957"><teiHeader><fileDesc><titleStmt><title>Daw
es Notebooks note
fragment</title></titleStmt><publicationStmt><p>For use
by the Dawes Notebooks site. DO NOT EDIT THIS
XML</p></publicationStmt><sourceDesc><p>Created
from dawes.xml by split-
xml.xsl.</p></sourceDesc></fileDesc><profileDesc><lan
gUsage><language
ident="eng">English</language><language
ident="fre">French</language><language
ident="lat">Latin</language><language
ident="syd">Sydney
Language</language></langUsage></profileDesc></teiHe
ader><text><body><div type="info"><p><emph>Open
make (the door)</emph> [gloss to «<ref type="note"
target="note-burnurutbunga">Bûmûrût<w
sameAs="#bunga">bûŋa</w></ref>»]</p><p><emph>This
occurrence: </emph><ref type="msview" target="book-b-
page-4">B4</ref></p></div></body></text></TEI>28

```

# The Notebooks of *William Dawes' Notebooks on the Aboriginal Language of Sydney*



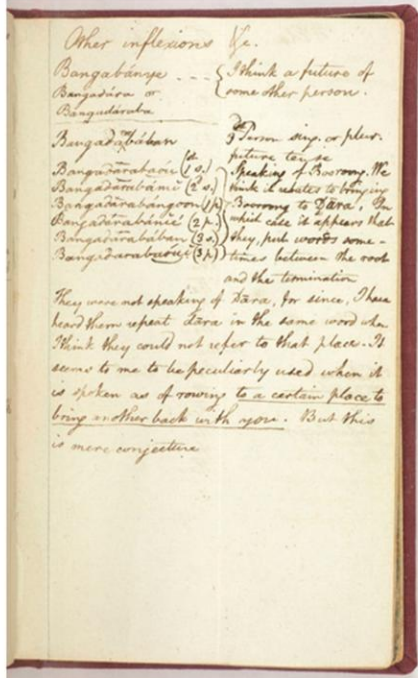
THE NOTEBOOKS OF WILLIAM  
DAWES ON  
THE ABORIGINAL LANGUAGE  
OF SYDNEY

Views  
▶ Switch to edited view  
▶ View high resolution image

**Book A,**  
**Page 18**

Prev Contents Next

Manuscripts Book A ▼ Manuscripts Book B ▼ Manuscripts Book C ▼



Other inflexions &c.  
Bangabánye I think a future of  
some other person.  
Bangadára or  
Bangadábában 3<sup>d</sup> Person sing. or plur.  
future tense  
Bangadārabāou (1<sup>st</sup> s.) Speaking of Booroong. We  
Bangadārabāmī (2<sup>d</sup> s.) think it relates to bringing  
Booroong to Dāra. In  
Bangadārabāngoon (1 p.) which case it appears that  
Bangadārabānié (2 p.) they, put words some-  
times between the root  
and the termination  
Bangadārabāban (3 s.)  
Bangadārabāoui (3 p)

They were not speaking of Dāra, for since, I have  
heard them repeat dāra in the same word when  
I think they could not refer to that place. It  
seems to me to be peculiarly used when it  
is spoken as of rowing to a certain place to  
bring another back with you. But this  
is mere conjecture

Other inflexions &c.  
Bangabánye I think a future of  
some other person.  
Bangadára or  
Bangadábában 3<sup>d</sup> Person sing. or plur.  
future tense  
Bangadārabāou (1<sup>st</sup> s.) Speaking of Booroong. We  
Bangadārabāmī (2<sup>d</sup> s.) think it relates to bringing  
Booroong to Dāra. In  
Bangadārabāngoon (1 p.) which case it appears that  
Bangadārabānié (2 p.) they, put words some-  
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bring another back with you. But this  
is mere conjecture

[see site](#)

# On both dictionaries and maps as hypertexts

Hypertext properties go beyond links:

- usage involves collaboration across time and the content-space, between author and reader
- multiple users, multiple purposes
- users can enter and leave anywhere
- users can change granularity
- users can either attend to, or ignore, features/content

End

Thank you

