Messages in a bottle:
Small mammal bones from discarded bottles

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Wait what, bones in bottles?

- Thirsty small mammals go into discarded bottles
- They die and their bones remain (along with dirt, dead insects, and isopods)
- ~Half of nonempty bottles contain bones
- Previously reported: Pagels, J.F. and French, T.W. 1987. Discarded bottles as a source of small mammal distribution data. *The American Midland Naturalist* 118(1):217-219.

Several of these bottles contained bones

Mouse in a bottle. Usually the animal is already decomposed.

Bottle contents, including some shrew skulls

Bones from one bottle (mostly rodents)

Where do you find them?

- Along roads outside cities
- Best areas are steep slopes below roads

A road near Berkeley where I found many bottled bones

Another nearby road that has yielded bottles

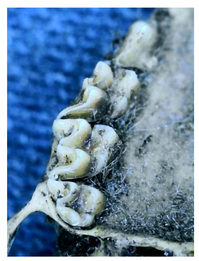
What do you find?

In 60 bottles from around Berkeley, CA:

- 73 *Sorex* (48%)
- 47 *Peromyscus* (31%)
- 26 *Reithrodontomys* (17%)
- 4 *Microtus* (3%)
- 1 *Mus* (1%)

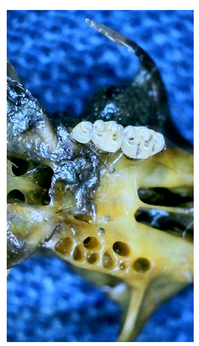
Elsewhere in CA, also found *Neurotrichus*

Neurotrichus *humerus*



Neurotrichus *maxillary dentition*

Grooved incisors indicate Reithrodontomys



Reithrodontomys *skull. Often some molars are lost.*

Peromyscus *skull*

Peromyscus *mandible*

Microtus *skull*

Why does this matter?

- Education: Introduce students to local mammals and their osteology
- Research: Non-invasive way to study small mammal populations
- Conservation: Potentially significant source of mortality

Mus *mandible. Invasive rodents are very rare in my samples.*

Sorex *mandible with stunning red teeth.*

Sorex *skull. Sometimes the teeth are stained black.*

Peromyscus *skeleton. Finding the whole skeleton requires a careful search.*