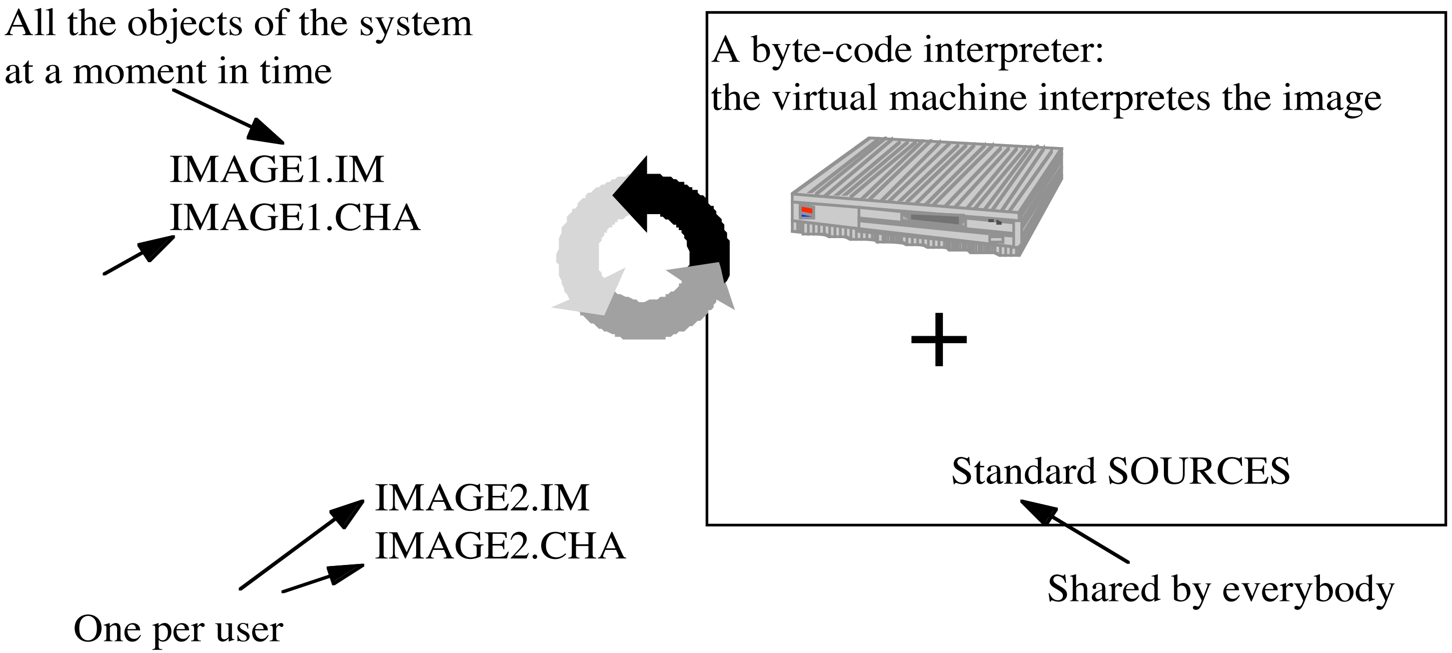
The Squeak Environment

Smalltalk Run-Time Architecture

Virtual Machine + Image + Changes and Sources



All the objects of the system at a moment in time

IMAGE1.IM
IMAGE1.CHA

A byte-code interpreter:
the virtual machine interpretes the image

+

Standard SOURCES

IMAGE2.IM
IMAGE2.CHA

One per user

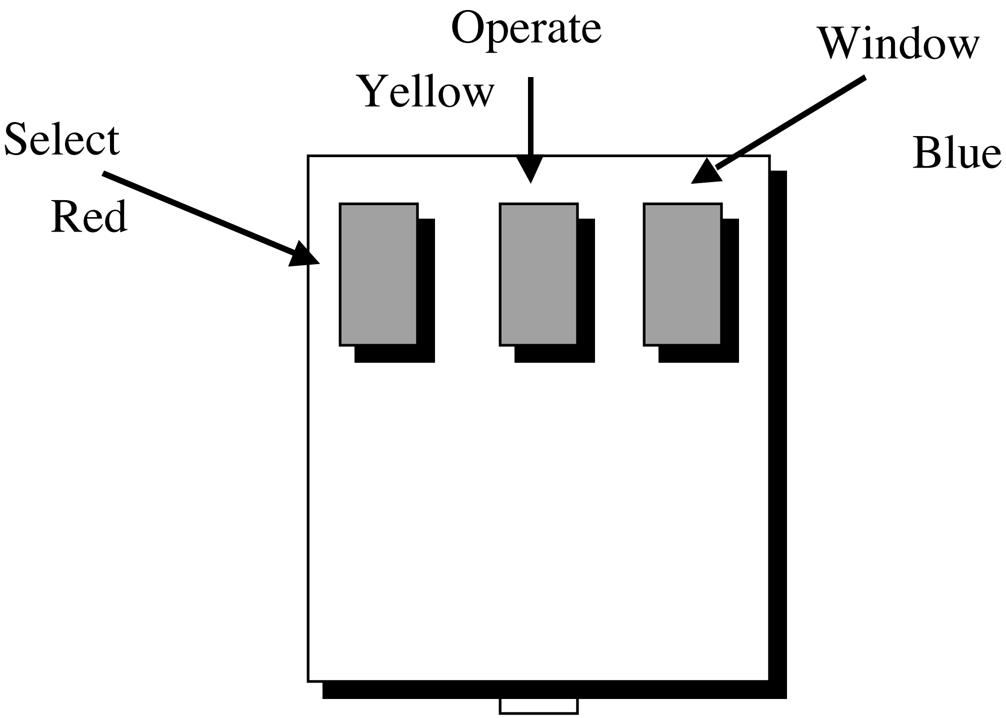
Shared by everybody

Image = bytecodes
Sources and changes = code (text)

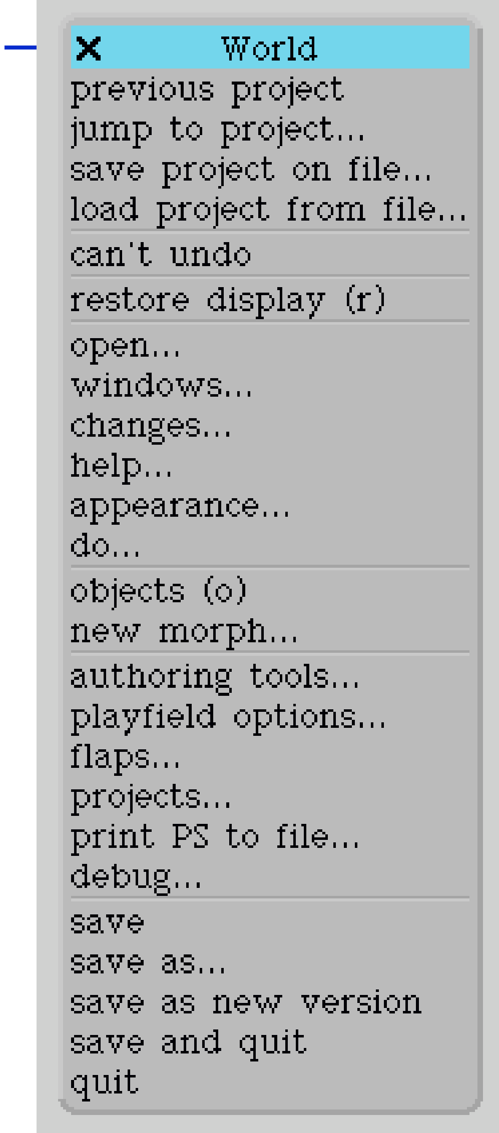
Runtime Architecture

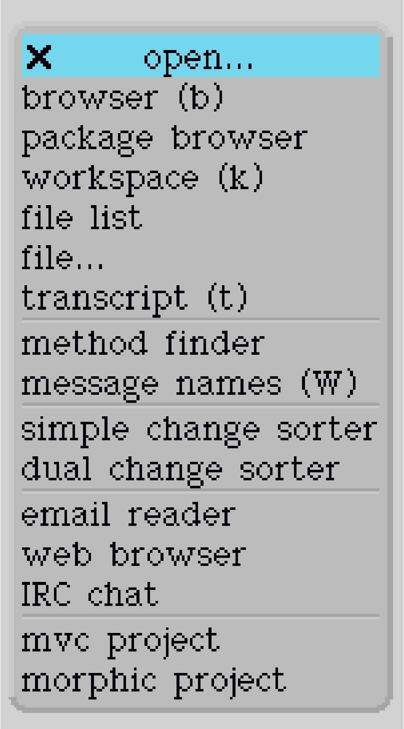
- The byte-code is in fact translated into native code by a just-in-time compiler.
- The source and the changes are not necessary for interpreting the byte-code, this is just for the development. Normally they are removed for deployment.
- An application can be delivered as some byte-code files that will be executed with a VM. The development image is stripped to remove the unnecessary development components.

Mouse Semantics

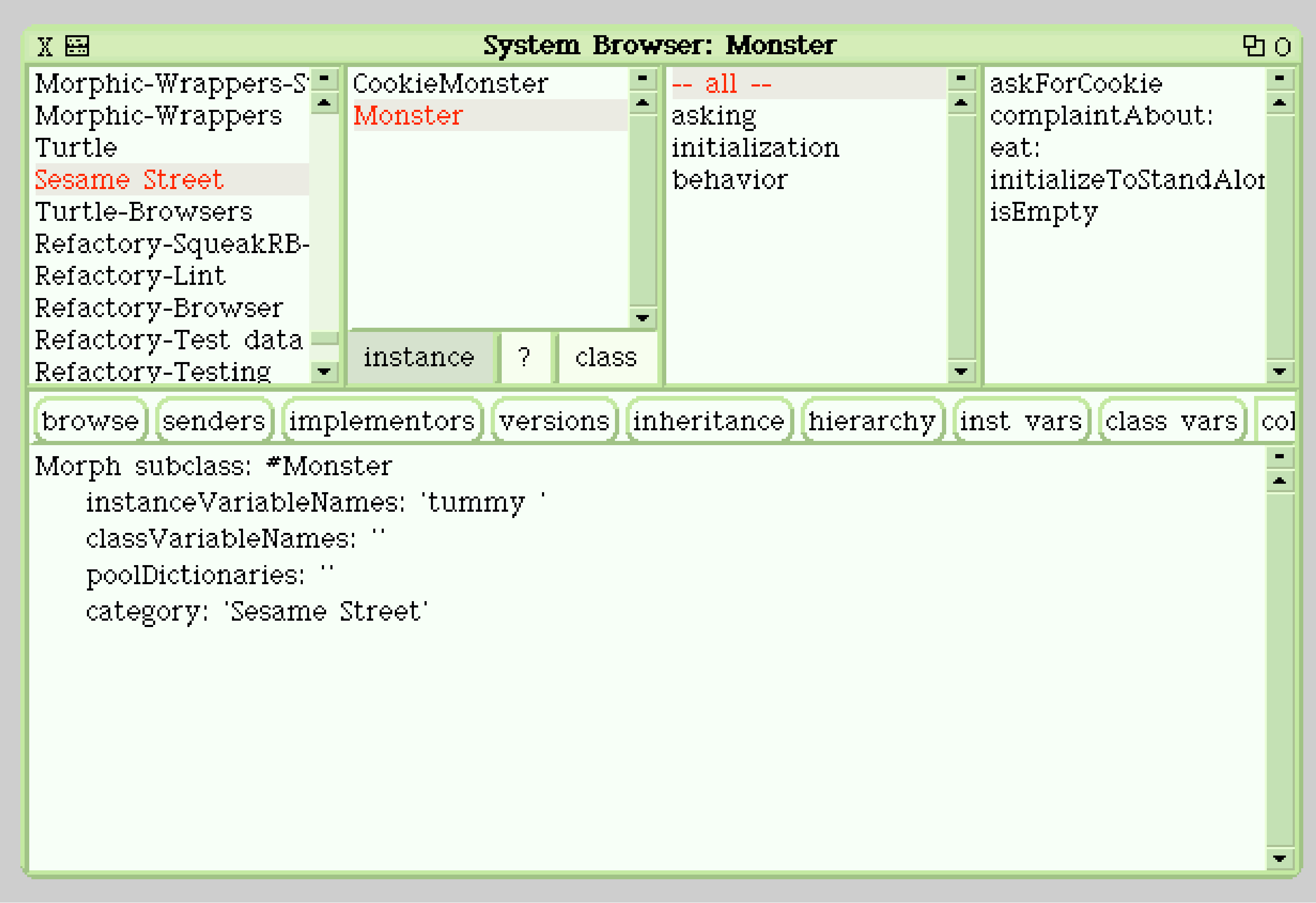


World Menu and Open Menu



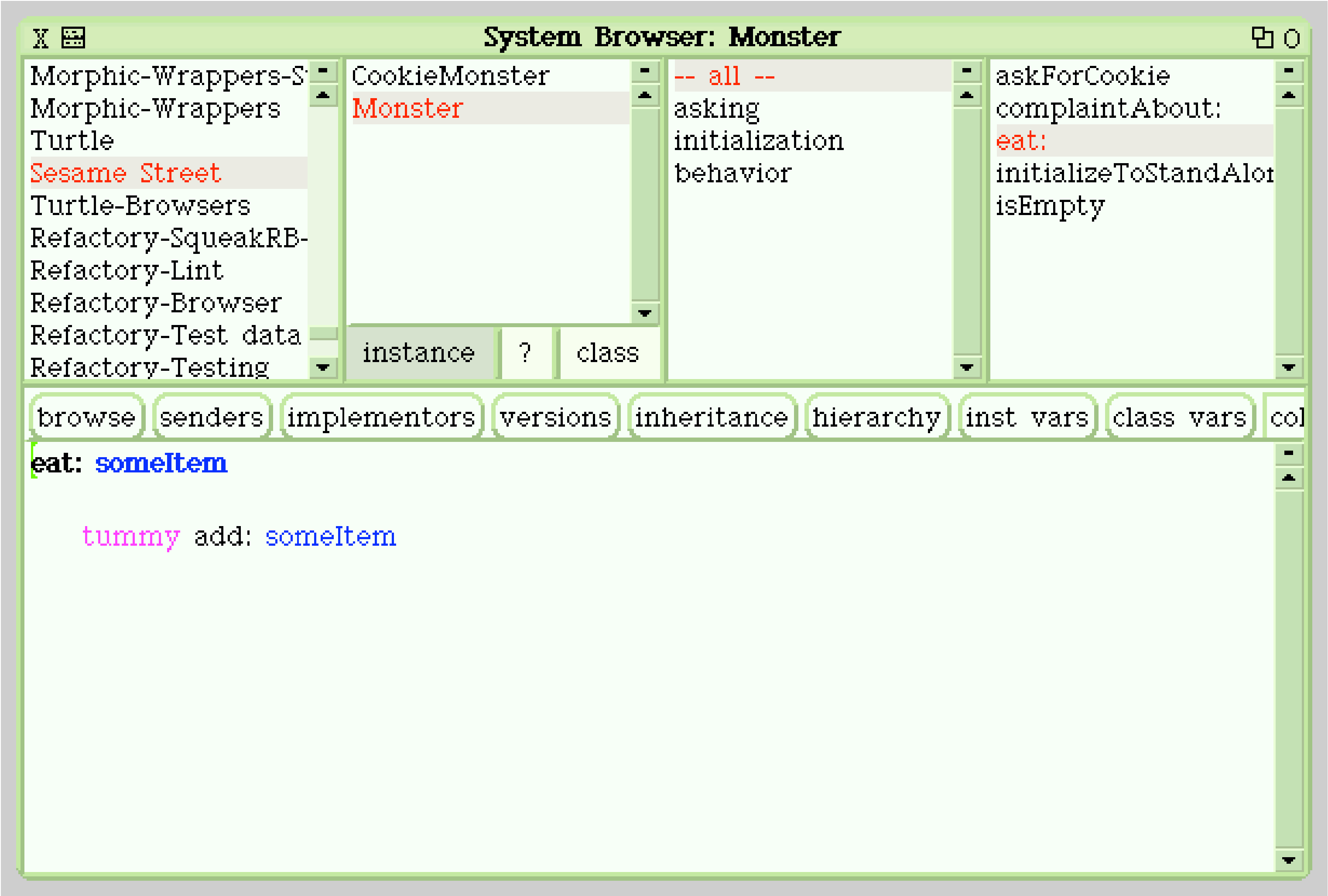


Browsing a class



```
Morph subclass: #Monster
    instanceVariableNames: 'tummy '
    classVariableNames: ''
    poolDictionaries: ''
    category: 'Sesame Street'
```

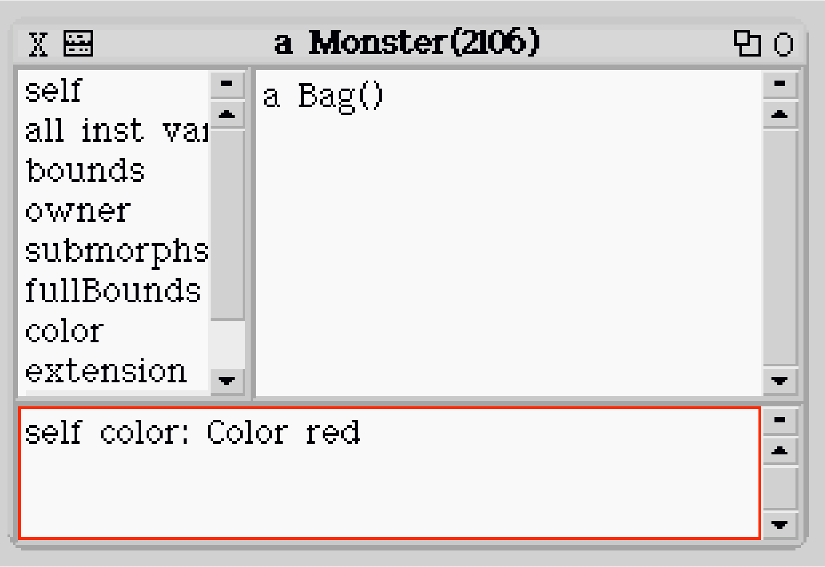
Browsing methods



```
eat: someItem

    tummy add: someItem
```

Inspector

- To look inside objects
- Violates encapsulation!!!
- Monster new inspect

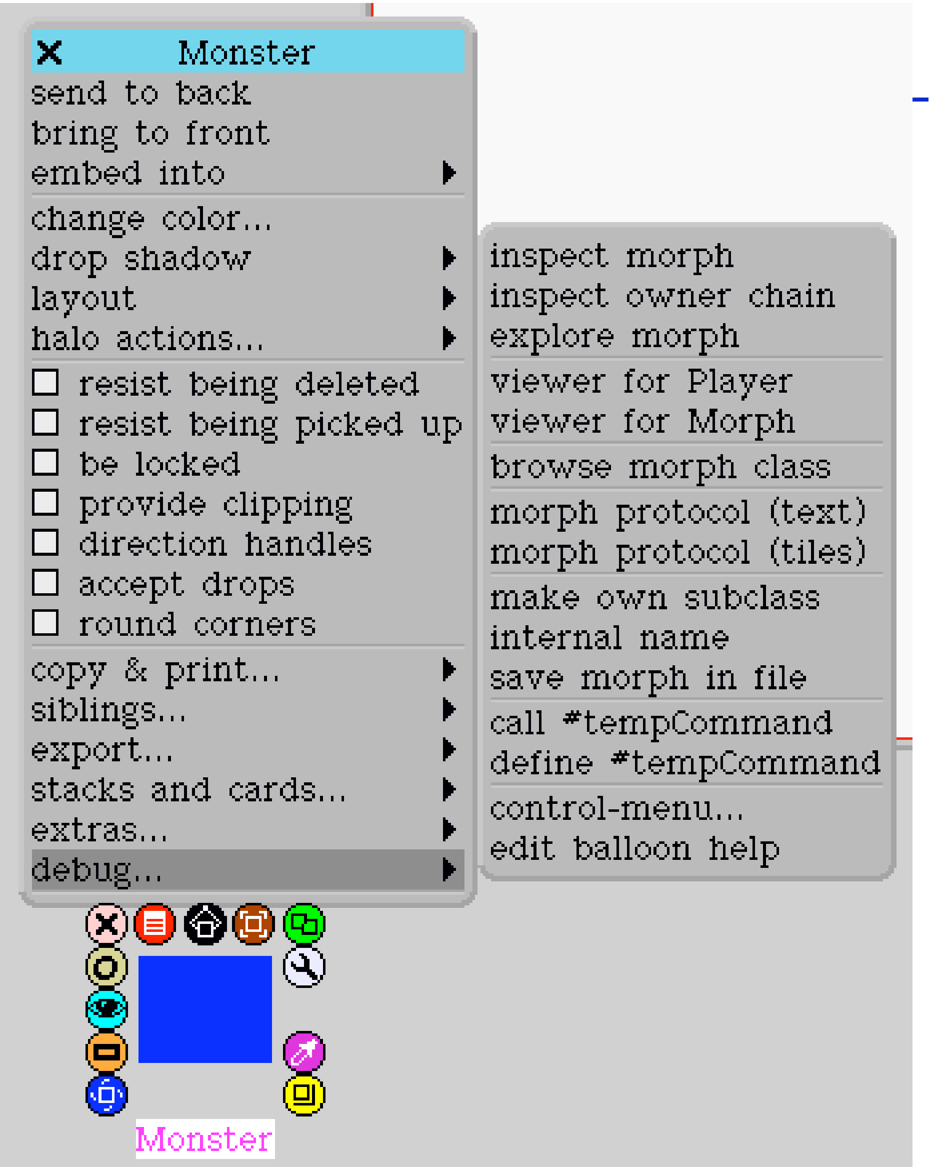


```
a Bag()
```

```
self color: Color red
```

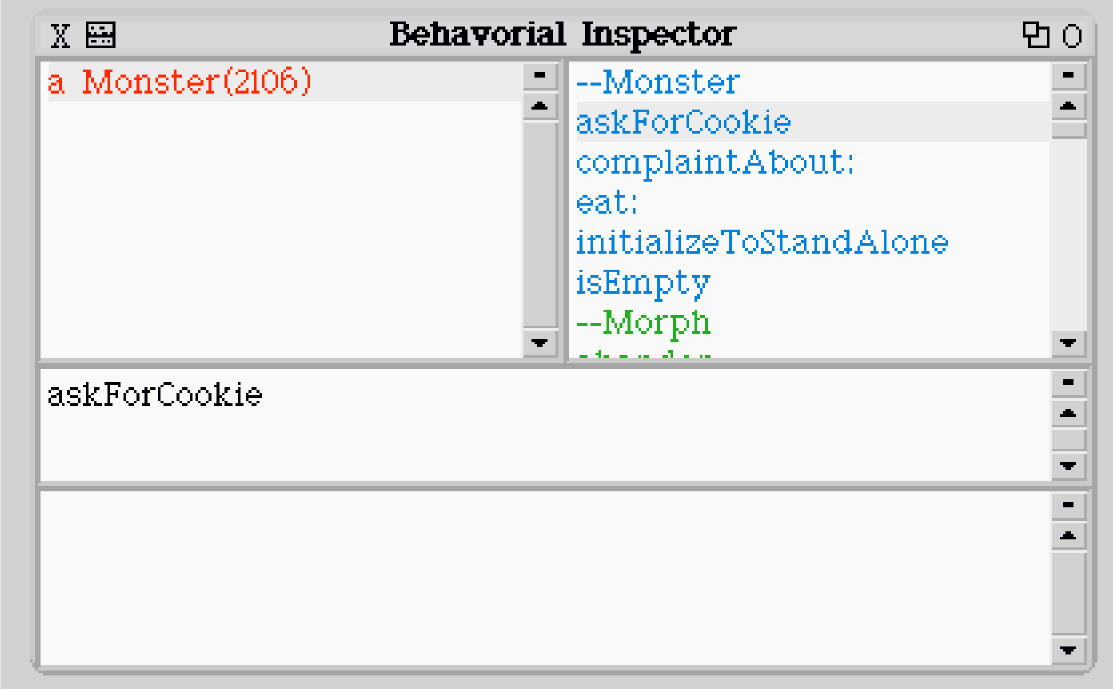
Direct Manipulation

- Bring the halo
- Experiment



Behavioral Inspector

- Do not break encapsulation
- myObject behavioralInspect

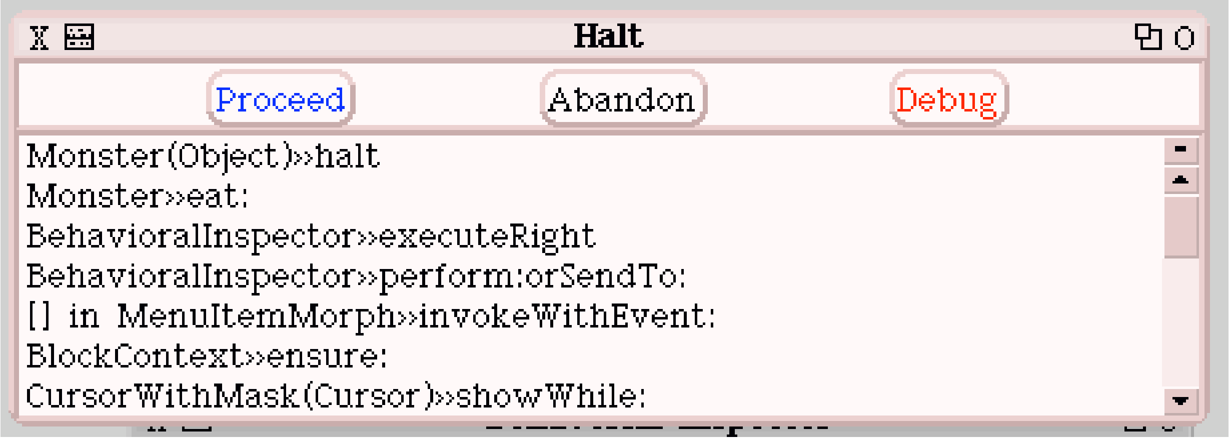


```
a Monster(2106)
```

```
--Monster
askForCookie
complaintAbout:
eat:
initializeToStandAlone
isEmpty
--Morph
```

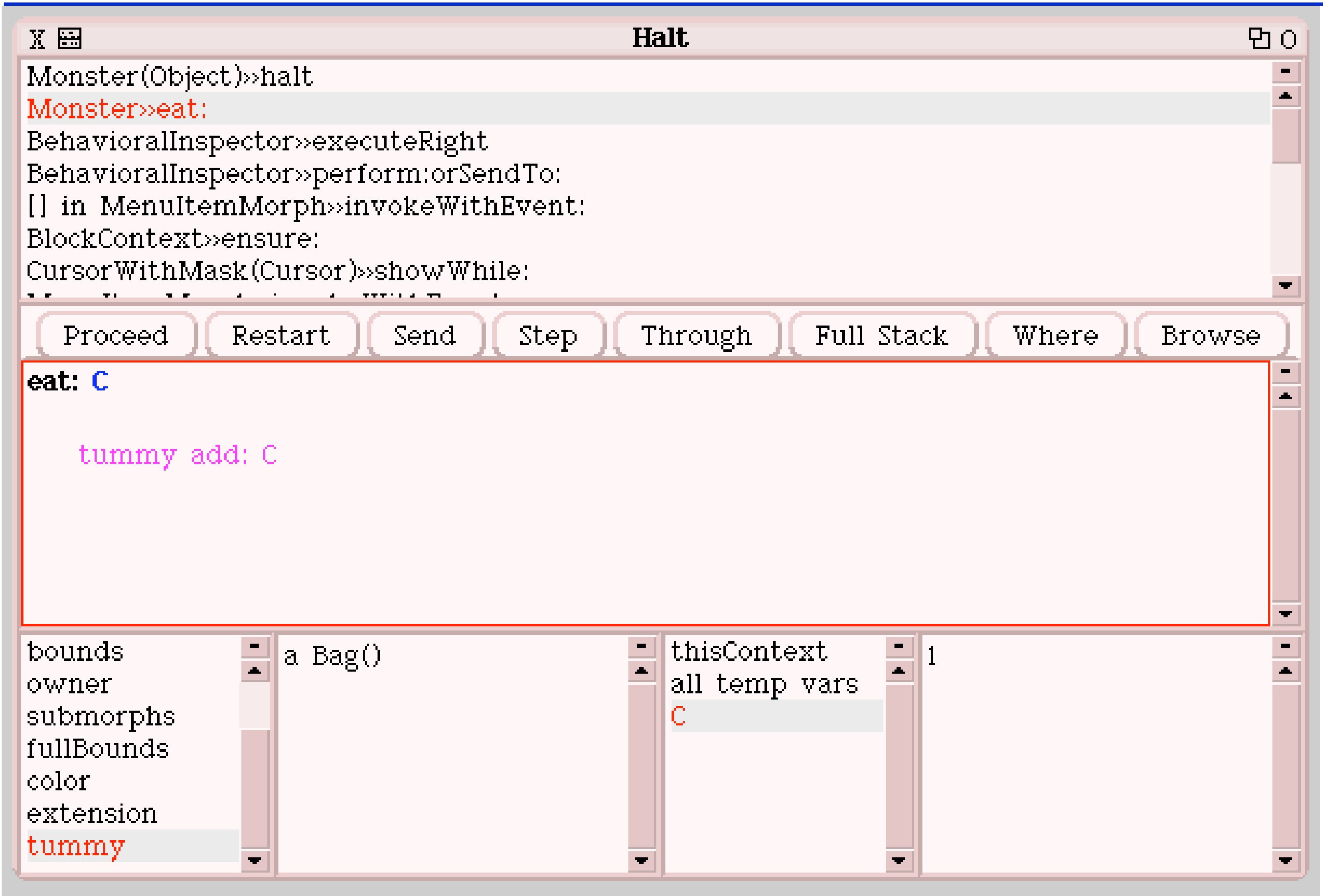
```
askForCookie
```

Debugger?



```
Monster(Object)»halt
Monster»eat:
BehavioralInspector»executeRight
BehavioralInspector»perform:orSendTo:
[] in MenuItemMorph»invokeWithEvent:
BlockContext»ensure:
CursorWithMask(Cursor)»showWhile:
```

Debugger !!!



```
Monster(Object)>>halt
Monster>>eat:
BehavioralInspector>>executeRight
BehavioralInspector>>perform:orSendTo:
[] in MenuItemMorph>>invokeWithEvent:
BlockContext>>ensure:
CursorWithMask(Cursor)>>showWhile:
```

```
eat: c

    tummy add: c
```

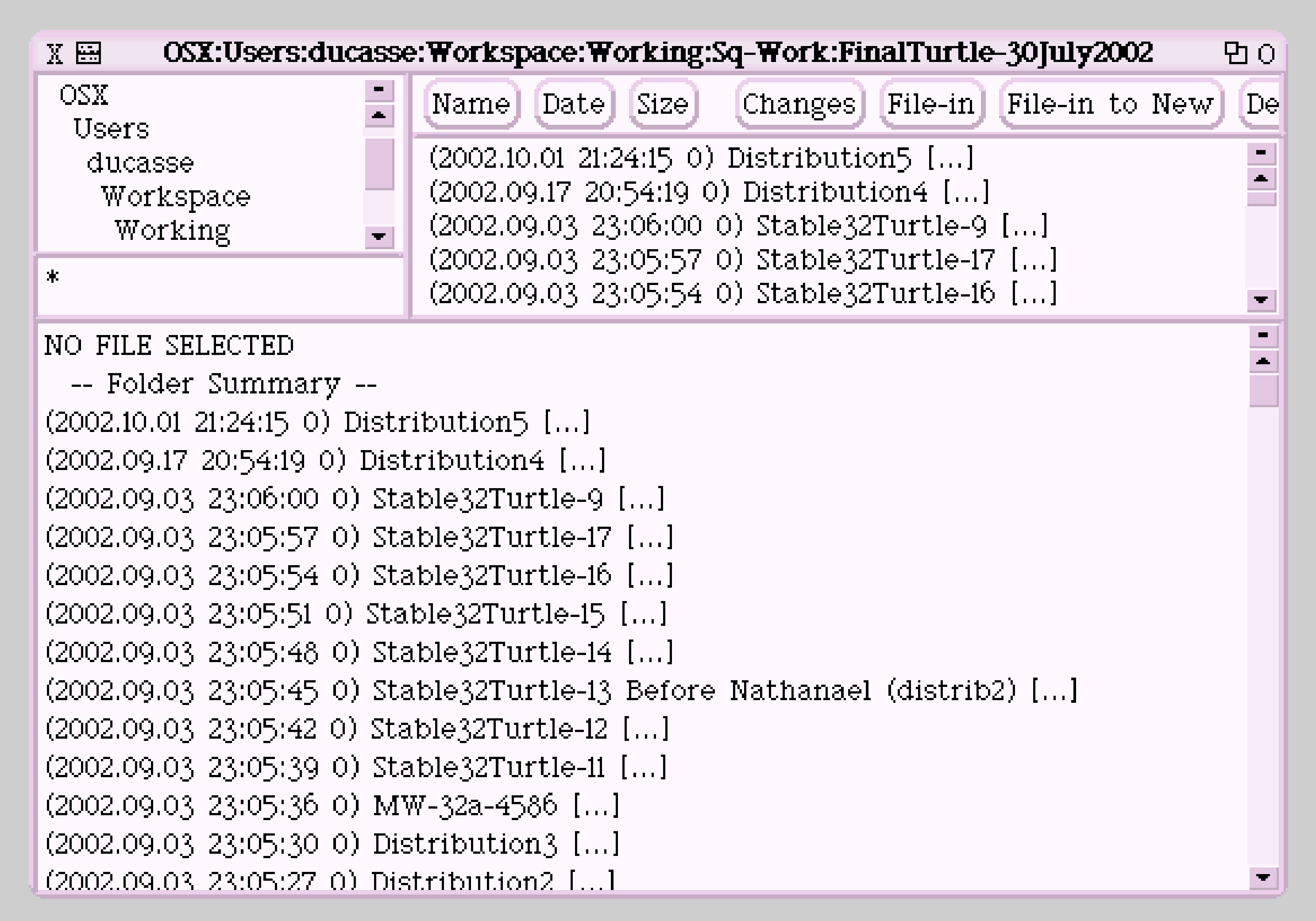
```
bounds
owner
submorphs
fullBounds
color
extension
tummy
```

```
a Bag()
```

```
thisContext
all temp vars
c
```

```
1
```

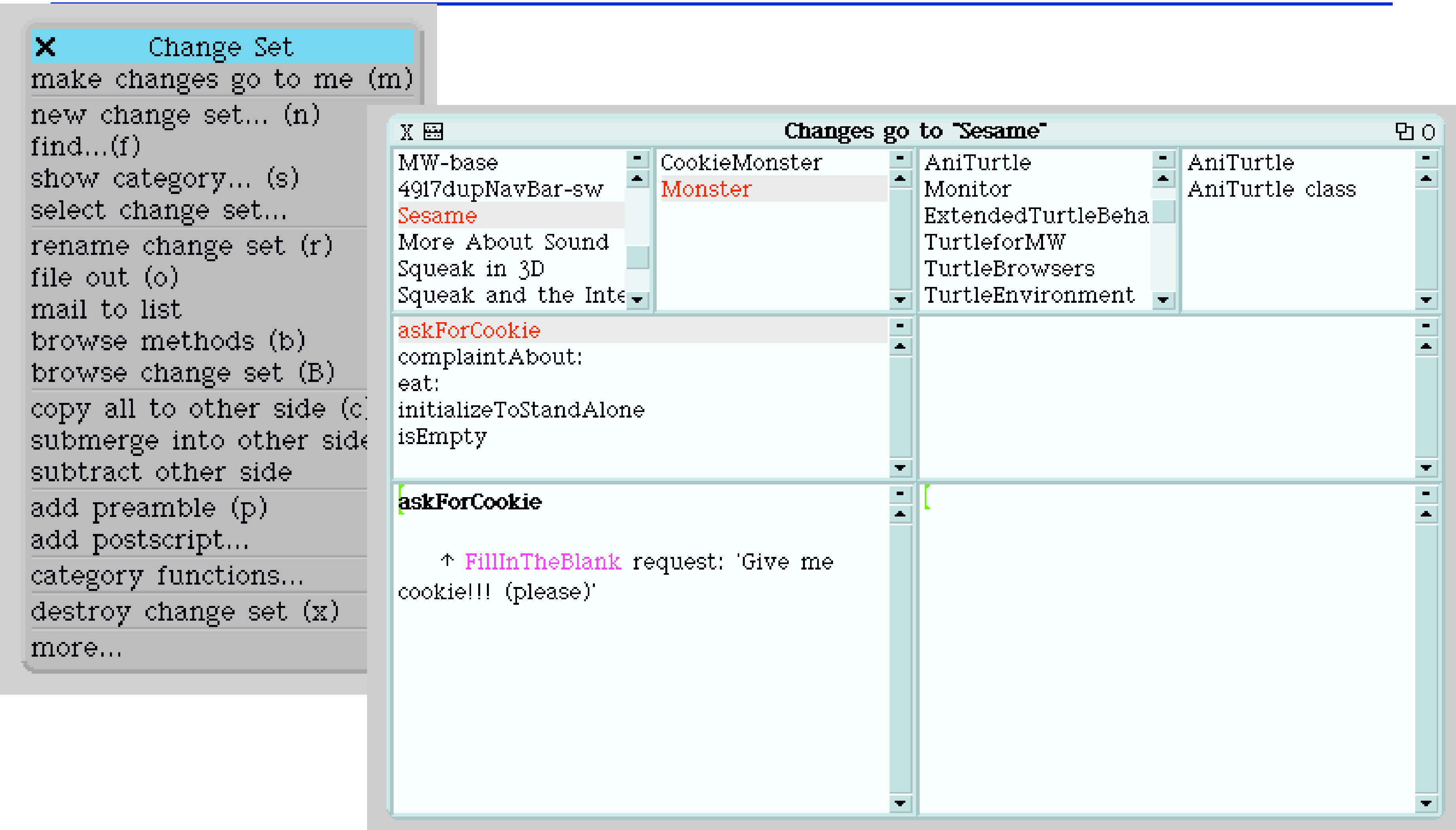
FileList



```
(2002.10.01 21:24:15 0) Distribution5 [...]
(2002.09.17 20:54:19 0) Distribution4 [...]
(2002.09.03 23:06:00 0) Stable32Turtle-9 [...]
(2002.09.03 23:05:57 0) Stable32Turtle-17 [...]
(2002.09.03 23:05:54 0) Stable32Turtle-16 [...]
```

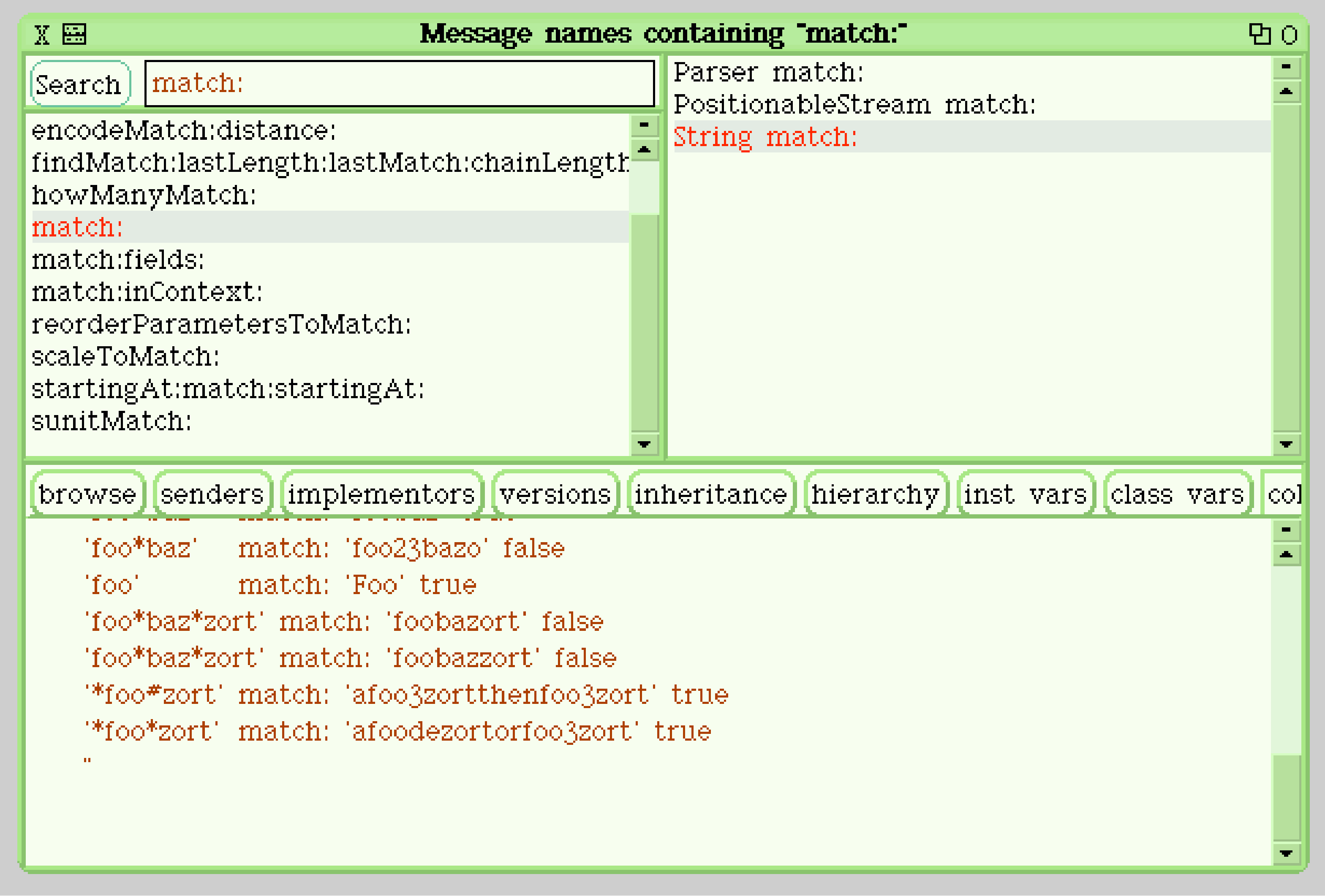
```
NO FILE SELECTED
  -- Folder Summary --
(2002.10.01 21:24:15 0) Distribution5 [...]
(2002.09.17 20:54:19 0) Distribution4 [...]
(2002.09.03 23:06:00 0) Stable32Turtle-9 [...]
(2002.09.03 23:05:57 0) Stable32Turtle-17 [...]
(2002.09.03 23:05:54 0) Stable32Turtle-16 [...]
(2002.09.03 23:05:51 0) Stable32Turtle-15 [...]
(2002.09.03 23:05:48 0) Stable32Turtle-14 [...]
(2002.09.03 23:05:45 0) Stable32Turtle-13 Before Nathanael (distrib2) [...]
(2002.09.03 23:05:42 0) Stable32Turtle-12 [...]
(2002.09.03 23:05:39 0) Stable32Turtle-11 [...]
(2002.09.03 23:05:36 0) MW-32a-4586 [...]
(2002.09.03 23:05:30 0) Distribution3 [...]
(2002.09.03 23:05:27 0) Distribution2 [...]
```

ChangeSorter: to sort your changes



```
askForCookie

	↑ FillInTheBlank request: 'Give me
cookie!!! (please)'
```

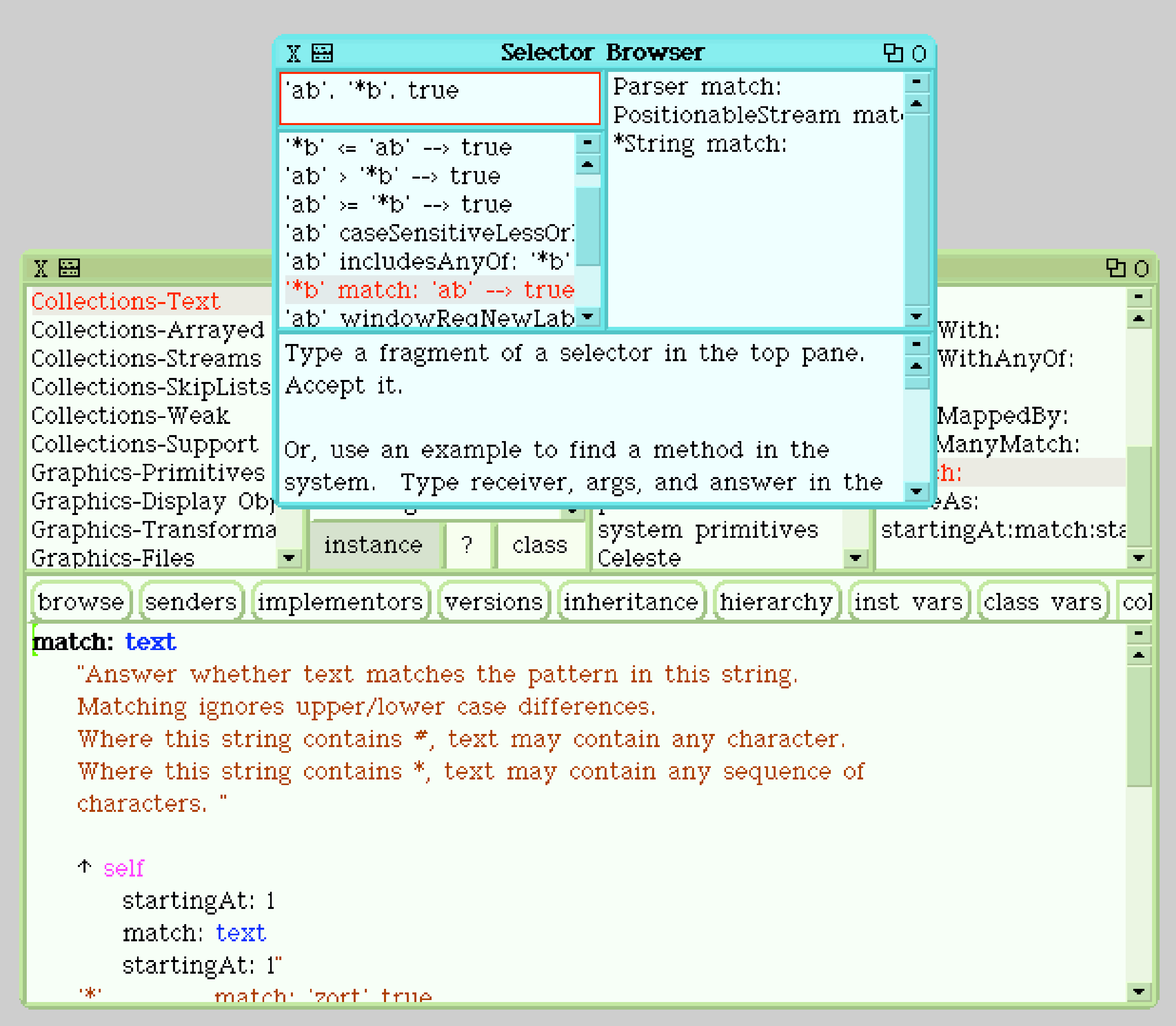
Message Names Finder



encodeMatch:distance:
findMatch:lastLength:lastMatch:chainLength
howManyMatch:
match:
match:fields:
match:inContext:
reorderParametersToMatch:
scaleToMatch:
startingAt:match:startingAt:
sunitMatch:

Parser match:
PositionableStream match:
String match:

```
    'foo*baz'   match: 'foo23bazo' false
    'foo'       match: 'Foo' true
    'foo*baz*zort' match: 'foobazort' false
    'foo*baz*zort' match: 'foobazzort' false
    '*foo#zort' match: 'afoo3zortthenfoo3zort' true
    '*foo*zort' match: 'afoodezortorfoo3zort' true
    "
```



```
'ab'. '*b'. true
```

```
'*b' <= 'ab' --> true
'ab' > '*b' --> true
'ab' >= '*b' --> true
'ab' caseSensitiveLessOr
'ab' includesAnyOf: '*b'
'*b' match: 'ab' --> true
'ab' windowReqNewLab
```

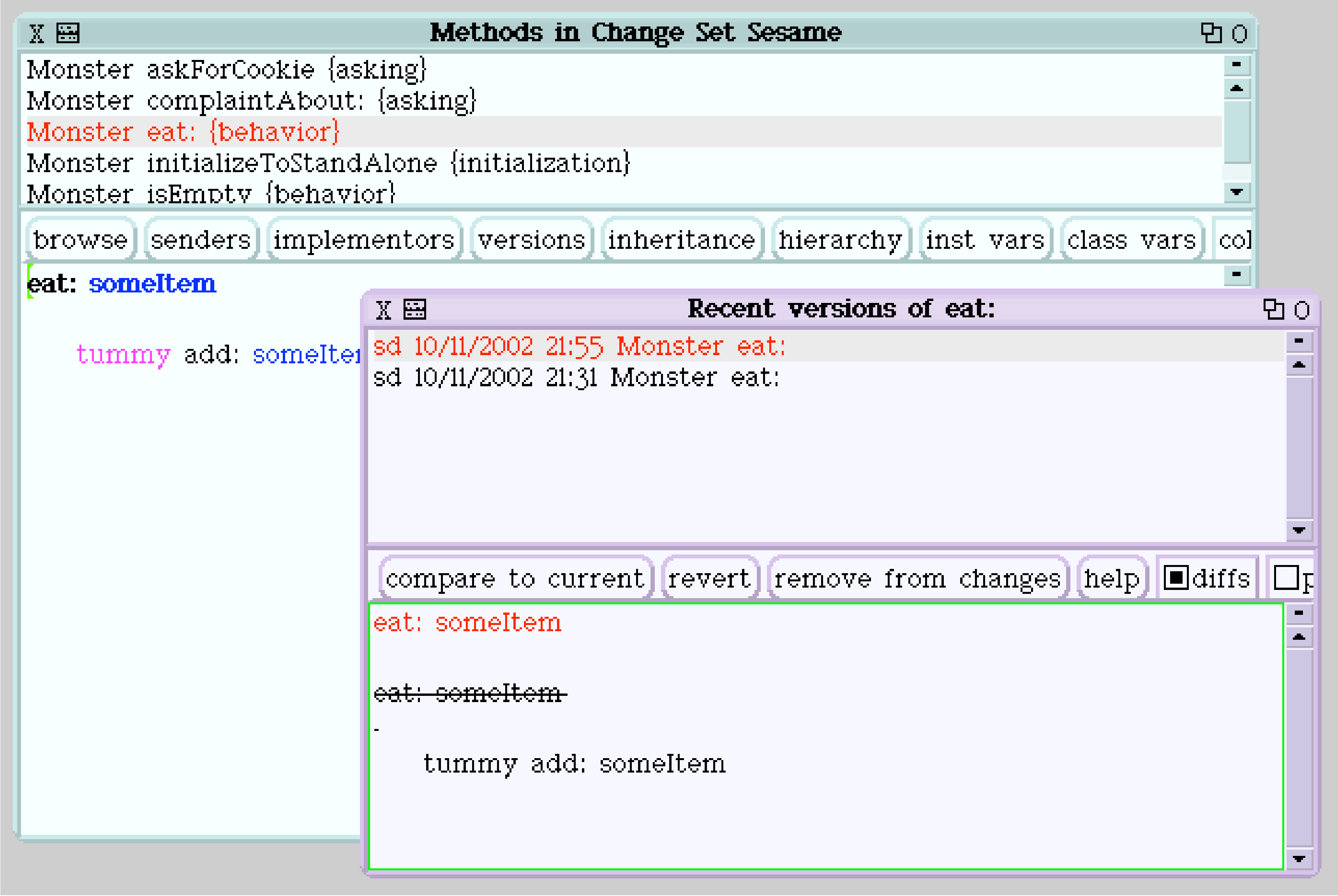
```
Parser match:
PositionableStream mat
*String match:
```

Type a fragment of a selector in the top pane. Accept it.

Or, use an example to find a method in the system. Type receiver, args, and answer in the

```
match: text
	"Answer whether text matches the pattern in this string.
	Matching ignores upper/lower case differences.
	Where this string contains #, text may contain any character.
	Where this string contains *, text may contain any sequence of
	characters. "

	↑ self
		startingAt: 1
		match: text
		startingAt: 1"
	'*'		match: 'zort' true
```

Methods in ChangeSets + Versions



Methods in Change Set Sesame

```
Monster askForCookie {asking}
Monster complaintAbout: {asking}
Monster eat: {behavior}
Monster initializeToStandAlone {initialization}
Monster isEmpty {behavior}
```

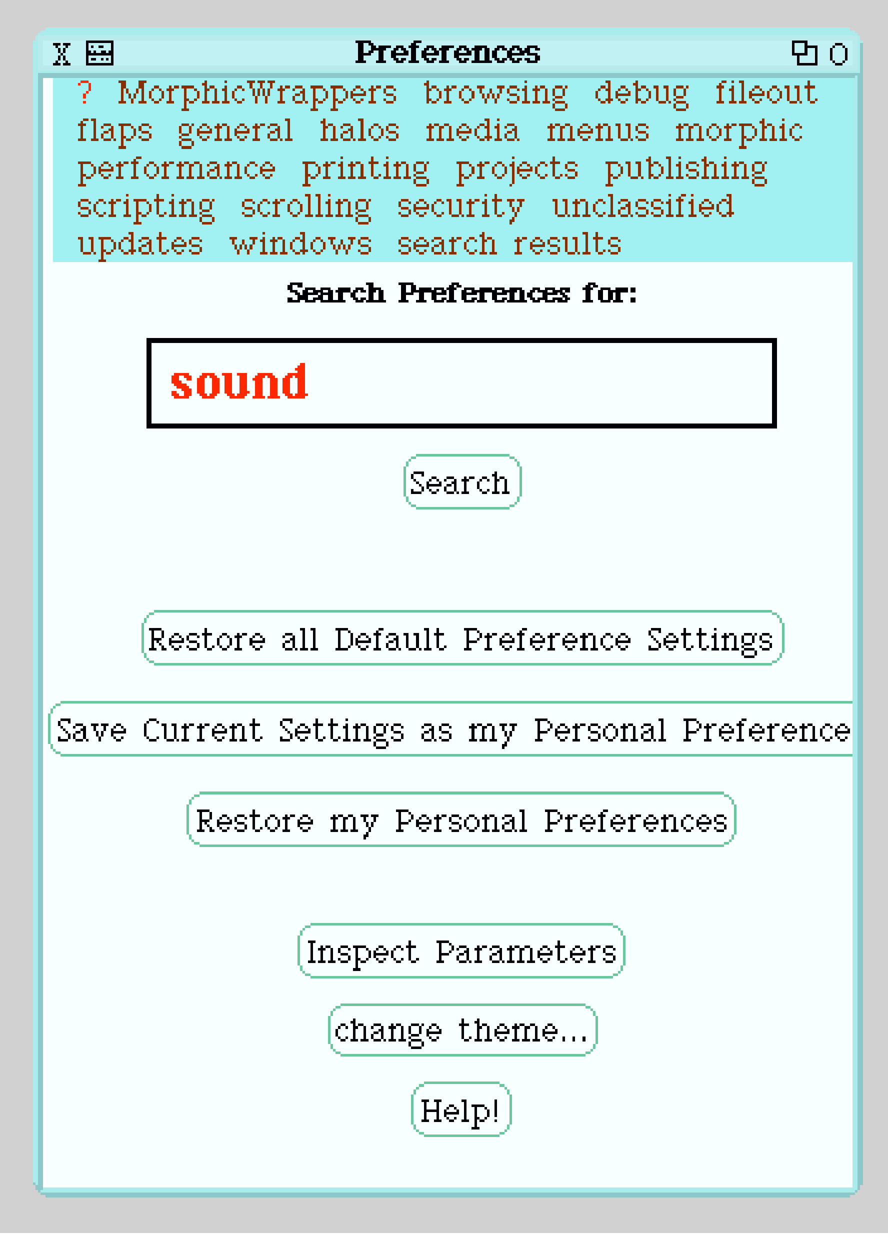
```
eat: someItem

    tummy add: someIte
```

Recent versions of eat:

```
sd 10/11/2002 21:55 Monster eat:
sd 10/11/2002 21:31 Monster eat:
```

```
eat: someItem

~~eat: someItem~~
-
    tummy add: someItem
```

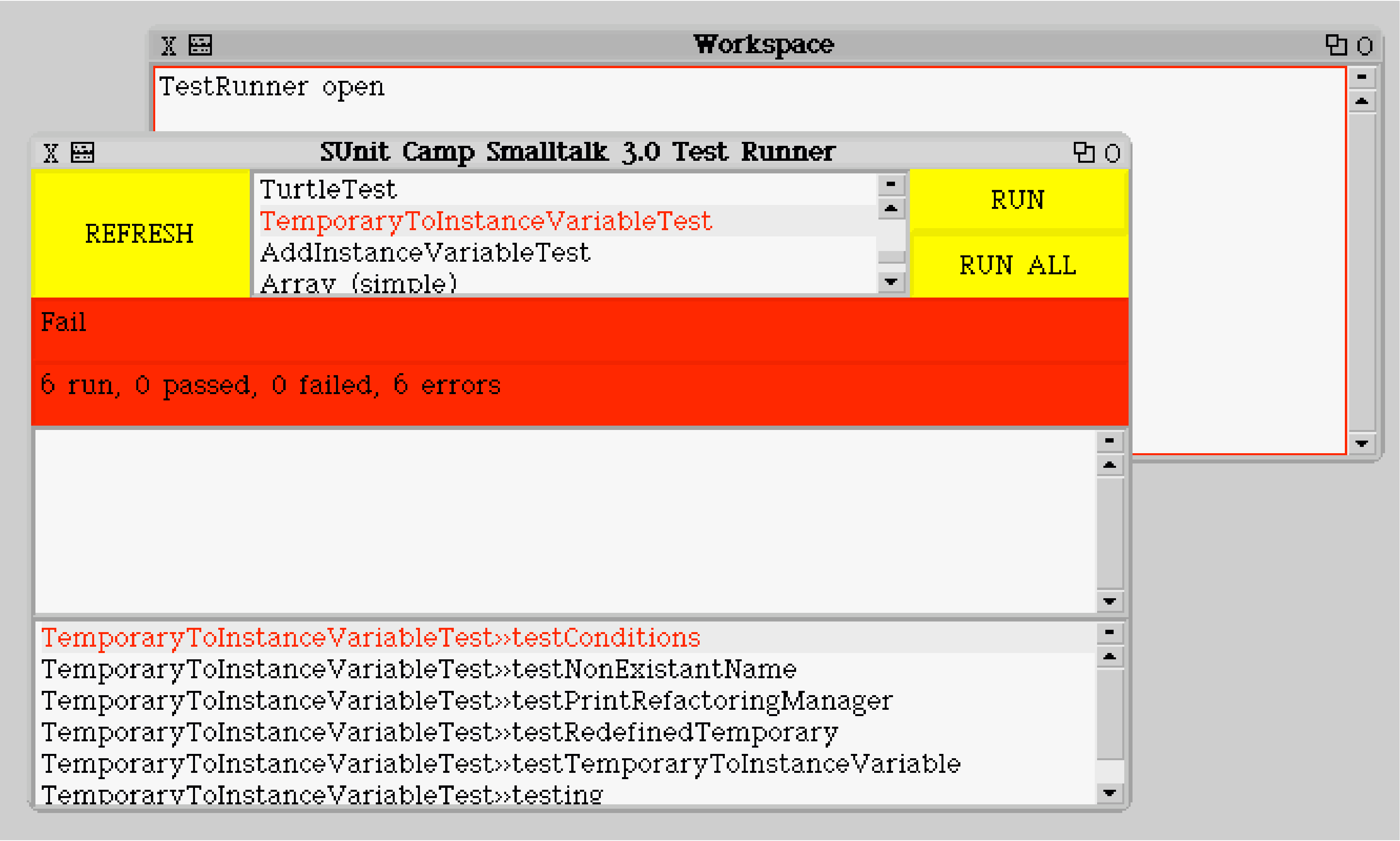
Preferences


X
Preferences
? MorphicWrappers browsing debug fileout
flaps general halos media menus morphic
performance printing projects publishing
scripting scrolling security unclassified
updates windows search results
Search
Restore all Default Preference Settings
Save Current Settings as my Personal Preference
Restore my Personal Preferences
Inspect Parameters
change theme...
Help!

Search Preferences for:

sound

SUnit



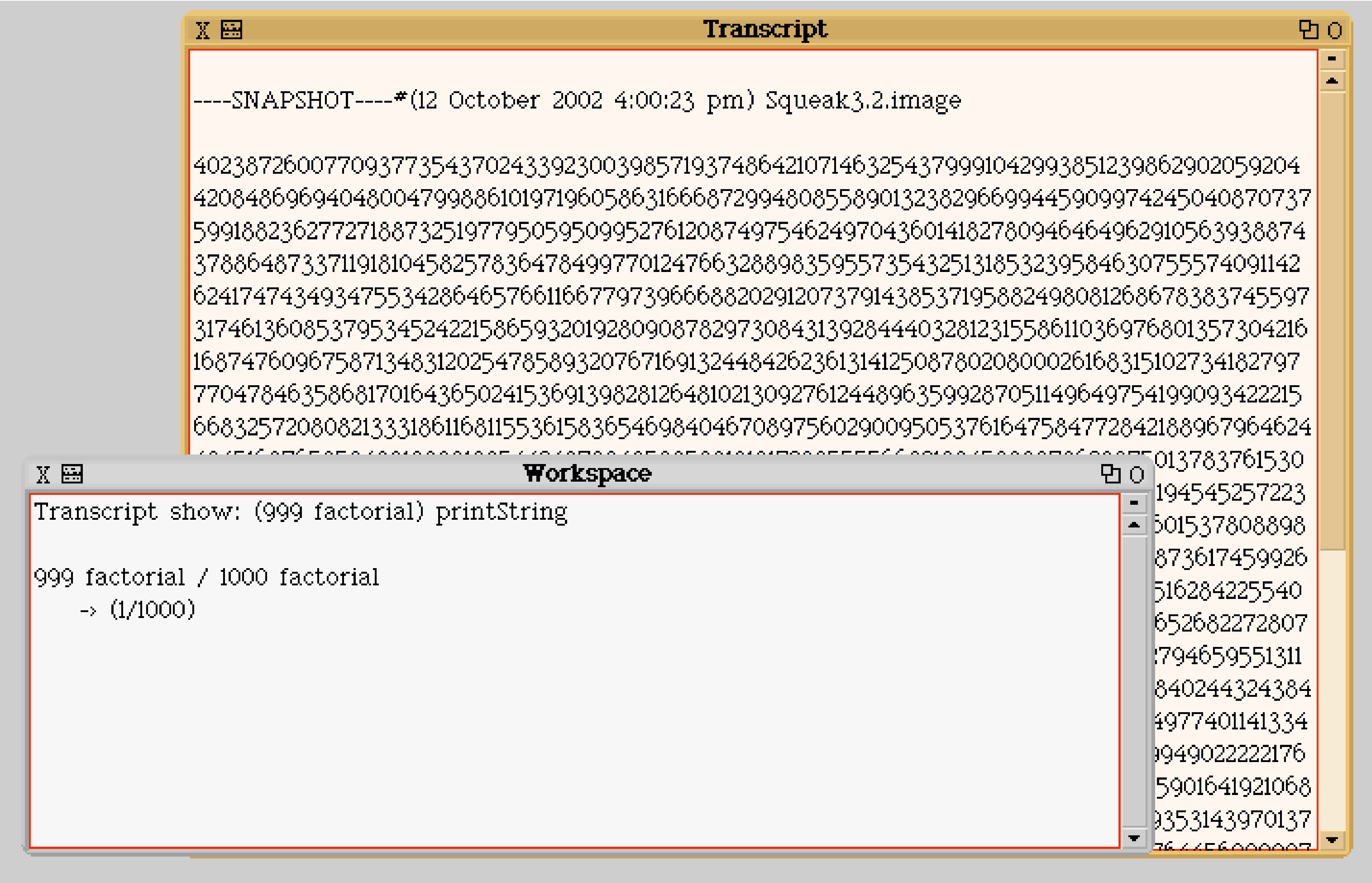
TestRunner open

SUnit Camp Smalltalk 3.0 Test Runner
REFRESH
TurtleTest
TemporaryToInstanceVariableTest
AddInstanceVariableTest
Array (simple)
RUN
RUN ALL

Fail

6 run, 0 passed, 0 failed, 6 errors

```
TemporaryToInstanceVariableTest>>testConditions
TemporaryToInstanceVariableTest>>testNonExistantName
TemporaryToInstanceVariableTest>>testPrintRefactoringManager
TemporaryToInstanceVariableTest>>testRedefinedTemporary
TemporaryToInstanceVariableTest>>testTemporaryToInstanceVariable
TemporaryToInstanceVariableTest>>testing
```

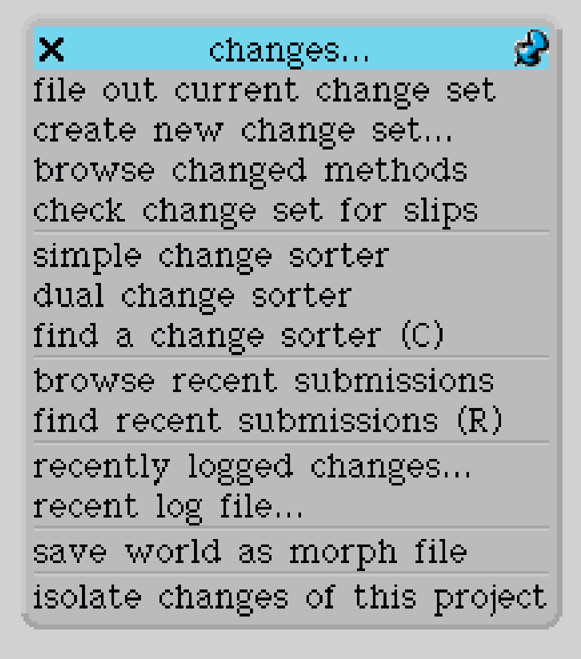


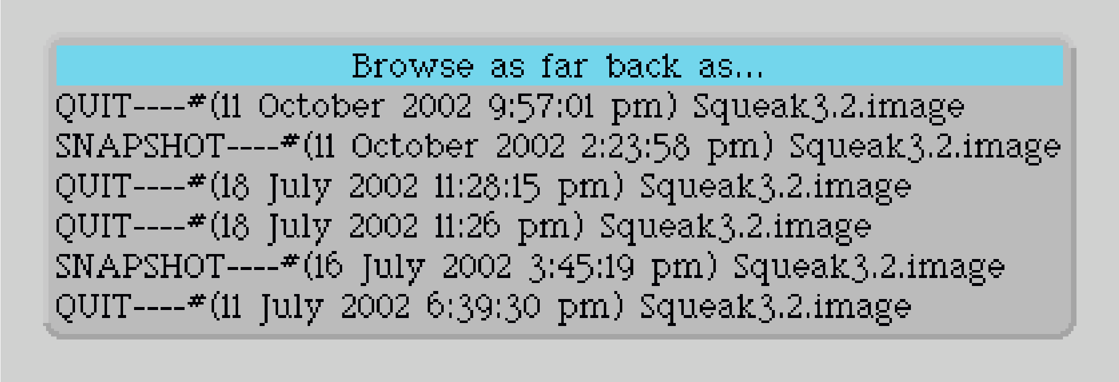
```
----SNAPSHOT----#(12 October 2002 4:00:23 pm) Squeak3.2.image

40238726007709377354370243392300398571937486421071463254379991042993851239862902059204
42084869694048004799886101971960586316668729948085589013238296699445909974245040870737
59918823627727188732519779505950995276120874975462497043601418278094646496291056393887 4
37886487337119181045825783647849977012476632889835955735432513185323958463075557409114 2
62417474349347553428646576611667797396668820291207379143853719588249808126867838374559 7
31746136085379534524221586593201928090878297308431392844403281231558611036976801357304216
16874760967587134831202547858932076716913244842623613141250878020800026168315102734182797
77047846358681701643650241536913982812648102130927612448963599287051149649754199093422215
66832572080821333186116811553615836546984046708975602900950537616475847728421889679646 24
                                                                          013783761530
                                                                          194545257223
                                                                          501537808898
                                                                          873617459926
                                                                          516284225540
                                                                          652682272807
                                                                          794659551311
                                                                          840244324384
                                                                          4977401141334
                                                                          949022222176
                                                                          5901641921068
                                                                          9353143970137
```

```
Transcript show: (999 factorial) printString

999 factorial / 1000 factorial
    -> (1/1000)
```

Changes Menu...Recently logged files

- Everything you do is recorded


changes...
file out current change set
create new change set...
browse changed methods
check change set for slips
simple change sorter
dual change sorter
find a change sorter (C)
browse recent submissions
find recent submissions (R)
recently logged changes...
recent log file...
save world as morph file
isolate changes of this project


Browse as far back as...

```
QUIT----#(11 October 2002 9:57:01 pm) Squeak3.2.image
SNAPSHOT----#(11 October 2002 2:23:58 pm) Squeak3.2.image
QUIT----#(18 July 2002 11:28:15 pm) Squeak3.2.image
QUIT----#(18 July 2002 11:26 pm) Squeak3.2.image
SNAPSHOT----#(16 July 2002 3:45:19 pm) Squeak3.2.image
QUIT----#(11 July 2002 6:39:30 pm) Squeak3.2.image
```

Change your Mind

- Everything you do is recorded !!
- So try and learn how to recover your code

- You are smart so
  - Experiment,
  - learn for you, browse,
  - be aggressive, ***all*** the code is there