Notice that we create a wave reference immediately after making the wave. Once we do this, we can use the wave reference in all of the ways shown in the preceding section. We can not create the wave reference before making the wave because a wave reference must refer to an existing wave.

The following example demonstrates that $wName and the wave reference w can refer to a wave that is not in the current data folder.

```
NewDataFolder root:Folder1
Test("root:Folder1:wave0")
```

## Wave Accessed Via String Calculated in Function

This technique is used when creating multiple waves in a function or when algorithmically selecting a wave or a set of waves to be processed.

```
Function Test(baseName, startIndex, endIndex)
   String baseName
   Variable startIndex, endIndex

   Variable index = startIndex
   do
      String name = baseName + num2istr(index)
      WAVE w = $name
      Variable avg = mean(w)
      Printf "Wave: %s; average: %g\r", NameOfWave(w), avg
      index += 1
   while (index <= endIndex)
End

Make/O/N=5 wave0=gnoise(1), wave1=gnoise(1), wave2=gnoise(1)
Test("wave", 0, 2)
```

We need to use this method because we want the function to operate on any number of waves. If the function were to operate on a small, fixed number of waves, we could use the wave parameter method.

As in the preceding section, we create the wave reference using $<string expression>.

## Wave Accessed Via Literal Wave Name

In data acquisition or analysis projects, you often need to write procedures that deal with runs of identically-structured data. Each run is stored in its own data folder and contains waves with the same names. In this kind of situation, you can write a set of functions that use literal wave names specific for your data structure.

```
Function CreateRatio()
   WAVE dataA, dataB
   Duplicate dataA, ratioAB
   WAVE ratioAB
   ratioAB = dataA / dataB
End

Make/O/N=5 dataA = 1 + p, dataB = 2 + p
CreateRatio()
```

The CreateRatio function assumes the structure and naming of the data. The function is hard-wired to this naming scheme and assumes that the current data folder contains the appropriate data.

We don’t need explicit wave reference variables because Make and Duplicate creat automatic wave reference for simple wave names, as explained under **Automatic Creation of WAVE References** on page IV-72.