- ***Making Quicksort nonrecursive.*** Although Quicksort is a recursive algorithm by nature—and is easiest to understand in recursive form—it's actually more efficient if the recursion is removed.

For details about improving Quicksort, consult a book on algorithm design, such as Robert Sedgewick's *Algorithms in C, Parts 1–4: Fundamentals, Data Structures, Sorting, Searching*, Third Edition (Boston, Mass.: Addison-Wesley, 1998).

Q & A

Q: **Some C books appear to use terms other than *parameter* and *argument*. Is there any standard terminology? [p. 184]**

A: As with many other aspects of C, there's no general agreement on terminology, although the C89 and C99 standards use *parameter* and *argument*. The following table should help you translate:

This book:	*Other books:*
parameter	formal argument, formal parameter
argument	actual argument, actual parameter

Keep in mind that—when no confusion would result—I sometimes deliberately blur the distinction between the two terms, using *argument* to mean either.

Q: **I've seen programs in which parameter types are specified in separate declarations after the parameter list, as in the following example:**

```
double average(a, b)
double a, b;
{
  return (a + b) / 2;
}
```

Is this practice legal? [p. 188]

A: This method of defining functions comes from K&R C, so you may encounter it in older books and programs. C89 and C99 support this style so that older programs will still compile. I'd avoid using it in new programs, however, for a couple of reasons.

First, functions that are defined in the older way aren't subject to the same degree of error-checking. When a function is defined in the older way—and no prototype is present—the compiler won't check that the function is called with the right number of arguments, nor will it check that the arguments have the proper types. Instead, it will perform the default argument promotions.

default argument promotions ➤*9.3*

Second, the C standard says that the older style is "obsolescent," meaning that its use is discouraged and that it may be dropped from C eventually.