begin on a multiple of four bytes, the a member of the s structure will be followed by a three-byte hole. As a result, `sizeof(s)` will be 8.

By the way, a structure can have a hole at the end, as well as holes between members. For example, the structure

```
struct {
  int a;
  char b;
} s;
```

might have a three-byte hole after the b member.

Q: Can there be a "hole" at the beginning of a structure?

A: No. The C standard specifies that holes are allowed only *between* members or *after* the last member. One consequence is that a pointer to the first member of a structure is guaranteed to be the same as a pointer to the entire structure. (Note, however, that the two pointers won't have the same type.)

Q: Why isn't it legal to use the == operator to test whether two structures are equal? [p. 382]

A: This operation was left out of C because there's no way to implement it that would be consistent with the language's philosophy. Comparing structure members one by one would be too inefficient. Comparing all bytes in the structures would be better (many computers have special instructions that can perform such a comparison rapidly). If the structures contain holes, however, comparing bytes could yield an incorrect answer; even if corresponding members have identical values, leftover data stored in the holes might be different. The problem could be solved by having the compiler ensure that holes always contain the same value (zero, say). Initializing holes would impose a performance penalty on all programs that use structures, however, so it's not feasible.

Q: Why does C provide two ways to name structure types (tags and `typedef` names)? [p. 382]

A: C originally lacked `typedef`, so tags were the only technique available for naming structure types. When `typedef` was added, it was too late to remove tags. Besides, a tag is still necessary when a member of a structure points to a structure of the same type (see the `node` structure of Section 17.5).

Q: Can a structure have both a tag *and* a `typedef` name? [p. 384]

A: Yes. In fact, the tag and the `typedef` name can even be the same, although that's not required:

```
typedef struct part {
  int number;
  char name[NAME_LEN+1];
  int on_hand;
} part;
```