

number mentioned at the beginning. But if we take the second constituent sentence on its own:

It's divisible by two. 17.37

there's nothing to determine what 'it' refers to. To avoid this, you should always *try to eliminate cross-referencing* when you translate. In the example just given, you should replace the translation in (17.35) by

[the number is even \leftrightarrow the number is divisible by two] 17.38

The same applies to (17.23) and (17.36). There are some more examples in the exercises below.

Exercise 17. Express each of the following sentences as faithfully as possible, using the truth-functors introduced in this section; remove cross-referencing where possible.

1. No dogs will be admitted.
2. The brain is bisected, yet the character remains intact.
3. Unless the safety conditions are tightened, there is going to be a nasty accident.
4. Supposing you're right, I stand to lose a lot of money.
5. You broke the law if and only if the agreement formed a contract.
6. If anybody calls, I shall pretend I am designing St Paul's.
7. Schubert is terrific, and so is Elvis Costello.
8. This is Bert Bogg, who taught me that limerick I was quoting yesterday.
9. You can only claim the allowance if you earn less than £160 a week.
10. Liszt is horrible, and the same goes for Vivaldi.
11. She needs all the help she can get, being a single parent.
12. The elder son was highly intelligent, while the younger had learning difficulties.
13. Her performance lacked zest.
14. If he gets anything right at all, he'll pass.
15. Either the metal will stretch, or it will snap.

If you want to wash your hands, the bathroom is first on 17.31

the left.

I won't sing, even if you pay me £1000. 17.32

In fact (17.32) is true in just the same situations as

I won't sing. 17.33

The difference lies in the emphasis alone.

(v) The *biconditional* truth-functor ' ϕ if and only if ψ '.

This truth-functor is written ' $\phi \leftrightarrow \psi$ '. Its truth-table is

17.34

ϕ	ψ	$[\phi \leftrightarrow \psi]$
T	T	T
T	F	F
F	T	F
F	F	T

Note the third line, which distinguishes ' \leftrightarrow ' from ' \rightarrow ': ' \leftrightarrow ' is pronounced 'if and only if'.

Two other phrases which carry the sense of ' \leftrightarrow ' are *precisely if* and *just if*:

The number is even *precisely if* it's divisible by two. 17.35

[the number is even \leftrightarrow it's divisible by two]

The company has to be registered *just if* its annual turnover 17.36

is above £15,000

[the company has to be registered \leftrightarrow its annual turnover is

above £15,000]

In America, but not normally in Britain, *just in case* is used in the same way.

This completes our list of basic truth-functors. There is one important point to bear in mind before we face any exercises. Our object is to analyse complex sentences into shorter ones, so that we can extract the shorter sentences in a tableau. Now if a complex sentence contains cross-referencing, the references of some of its parts may change when we extract the constituent sentences; we may even face referential failure. For example, in the first sentence of (17.35), the pronoun 'it' refers back to the