

experienced logician knows when to take care. (We shall return to this in section 28.)

(ii) The *conjunction* truth-functor ' $\phi$  and  $\psi$ '.

This truth-functor is written ' $[\phi \wedge \psi]$ '. It yields a false sentence unless truths are put for both ' $\phi$ ' and ' $\psi$ ', in which case it yields a truth. (Comparing with (7.1), one can see that we are assuming the weak reading of and.) Hence the truth-table is

$\phi$	$\psi$	$[\phi \wedge \psi]$	17.8
T	T	T	
T	F	F	
F	T	F	
F	F	F	

' $[\phi \wedge \psi]$ ' is called the *conjunction* of the sentences  $\phi$  and  $\psi$ ;  $\phi$  and  $\psi$  are its *conjuncts*. It is pronounced ' $\phi$  and  $\psi$ '.

Here are some other ways in which English expresses the sense of this truth-functor:

Although it was raining, he ran out in his vest.  
[it was raining  $\wedge$  he ran out in his vest] 17.9

The powder contains sulfur and magnesium.  
[the powder contains sulfur  $\wedge$  the powder contains magnesium] 17.10

The method is simple but effective.  
[the method is simple  $\wedge$  the method is effective] 17.11

Neither I nor my wife speak German.  
[I don't speak German  $\wedge$  my wife doesn't speak German] 17.12

The damping is effected by the water roller, which can be found above the plate cylinder.  
[the damping is effected by the water roller  $\wedge$  the water roller can be found above the plate cylinder] 17.13

Notice that in (17.10) and is between nouns instead of sentences. The word and can occur between adjectives too, and other parts of speech. We can usually rephrase the whole sentence so that and occurs just between sentences, allowing a translation by ' $\wedge$ ':

Your review of my book was both insulting and inaccurate. 17.14

[your review of my book was insulting  $\wedge$  your review of my book was inaccurate]

He coughs often and loudly. 17.15

[he coughs often  $\wedge$  he coughs loudly]

But sometimes this kind of rephrasing is quite wrong:

New York and Cairo are over a thousand miles apart. 17.16

NOT: [New York is over a thousand miles apart  $\wedge$  Cairo is over a thousand miles apart]

My sister wants a black and white cat. 17.17

NOT: [my sister wants a black cat  $\wedge$  my sister wants a white cat]

Twenty people were rounded up and shot. 17.18

NOT: [twenty people were rounded up  $\wedge$  twenty people were shot]

(iii) The *disjunction* truth-functor 'Either  $\phi$  or  $\psi$ , or both.' This truth-functor is written ' $[\phi \vee \psi]$ '; its truth-table is

$\phi$	$\psi$	$[\phi \vee \psi]$	17.19
T	T	T	
T	F	T	
F	T	T	
F	F	F	

The table shows that ' $[\phi \vee \psi]$ ' yields a truth in every case but one; the one case is where ' $\phi$ ' and ' $\psi$ ' are both replaced by false sentences. ' $[\phi \vee \psi]$ ' is called the *disjunction* of the sentences  $\phi$  and  $\psi$ , and  $\phi$  and  $\psi$  are called its *disjuncts*. It is pronounced ' $\phi$  or  $\psi$ '.

Here are some ways in which English expresses the sense of this truth-functor:

There will be a stiff wages policy, or we shall see massive unemployment. 17.20

[there will be a stiff wages policy  $\vee$  we shall see massive unemployment]