

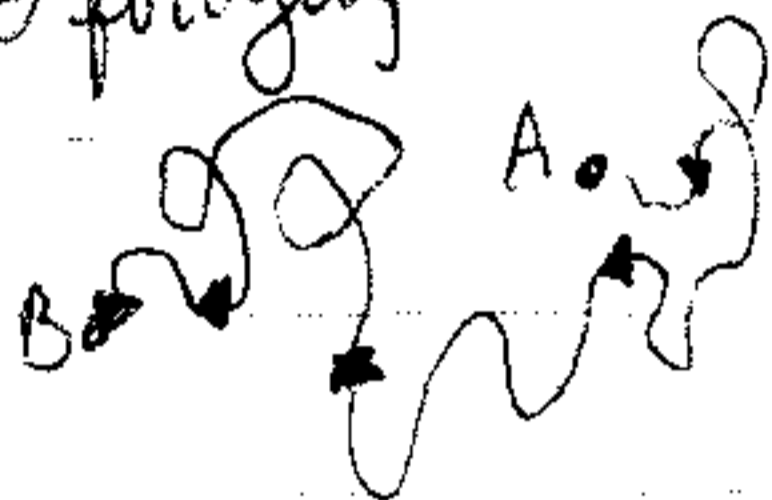
# Fred Dyer - Spatial Cognition in Honeybees

## Insect Cognition

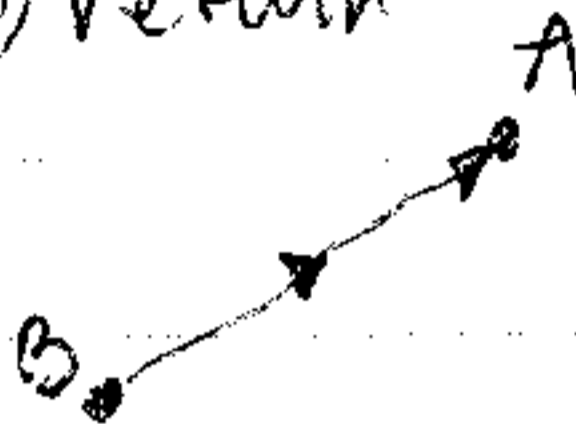
many of the cases appear to be less complex "cognition" than 1st thought

### e.g. Path Integration

(a) foraging



(b) return



Cognition (a) mapping betw. states of environment & states of the nervous system

(b) allow derivation of knowledge not previously experienced

## Orientation & Foraging in Honeybees

(a) large-scale spatial memory --- do they have metric maps

(A) could learn specific routes but NOT overall geometry of an area

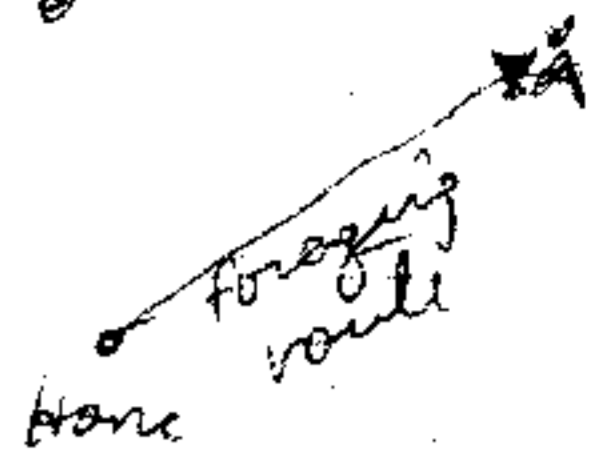
(B) could learn MAP

Bould showed bees that were trained for 1 site could go to that site directly even if displaced.

but

- ① might have big landmarks & could
- ② use them
- ③ might have traveled area before

B  
e



- displaced to B  
- return to A

So how do bees come by this memory?

① orientation flight

what does  
a bee do  
when  
disp/need?

## Solar Orientation

step (1(x))

