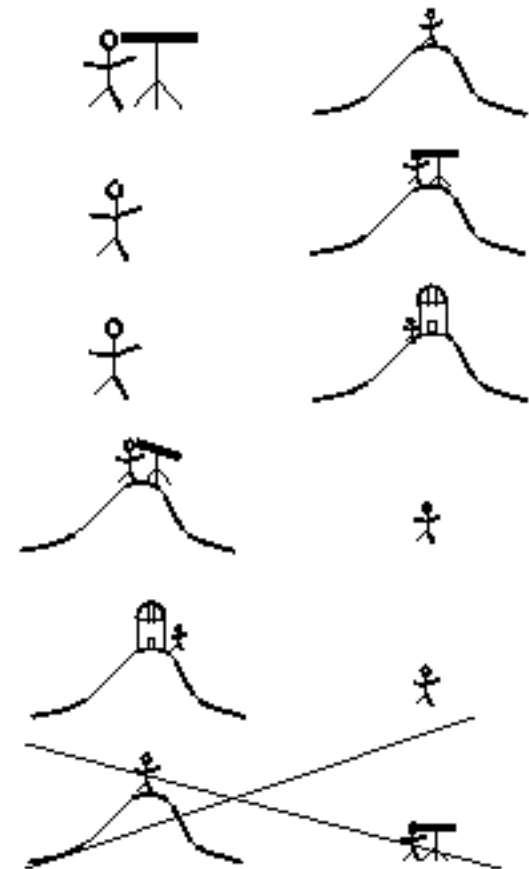


# Ambiguity

- Natural language is highly ambiguous and must be *disambiguated*.
  - I saw the man on the hill with a telescope.
  - I saw the Grand Canyon flying to LA.
  - Time flies like an arrow.
  - Horse flies like a sugar cube.
  - Time runners like a coach.
  - Time cars like a Porsche.



*by Ray Mooney, his lecture on IR*

# Ambiguity is Ubiquitous

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- Speech Recognition
  - “recognize speech” vs. “wreck a nice beach”
  - “youth in Asia” vs. “euthanasia”
- Syntactic Analysis
  - “I ate spaghetti **with** chopsticks” vs. “I ate spaghetti **with** meatballs.”
- Semantic Analysis
  - “The dog is in the **pen**.” vs. “The ink is in the **pen**.”
  - “I put the **plant** in the window” vs. “Ford put the **plant** in Mexico”
- Pragmatic Analysis
  - **From “The Pink Panther Strikes Again”:**
  - **Clouseau:** Does your dog bite?  
**Hotel Clerk:** No.  
**Clouseau:** [*bowing down to pet the dog*] Nice doggie.  
[*Dog barks and bites Clouseau in the hand*]  
**Clouseau:** I thought you said your dog did not bite!  
**Hotel Clerk:** That is not my dog.

# Ambiguity is Explosive

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- Ambiguities compound to generate enormous numbers of possible interpretations.
- In English, a sentence ending in  $n$  prepositional phrases has *over*  $2^n$  syntactic interpretations (cf. Catalan numbers).
  - “I saw the man with the telescope”: 2 parses
  - “I saw the man on the hill with the telescope.”: 5 parses
  - “I saw the man on the hill in Texas with the telescope”:  
14 parses
  - “I saw the man on the hill in Texas with the telescope at noon.”: 42 parses
  - “I saw the man on the hill in Texas with the telescope at noon on Monday” 132 parses

# Humor and Ambiguity

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- Many jokes rely on the ambiguity of language:
  - Groucho Marx: One morning I shot an elephant in my pajamas. How he got into my pajamas, I'll never know.
  - She criticized my apartment, so I knocked her flat.
  - Noah took all of the animals on the ark in pairs. Except the worms, they came in apples.
  - Policeman to little boy: “We are looking for a thief with a bicycle.” Little boy: “Wouldn't you be better using your eyes.”
  - Why is the teacher wearing sun-glasses. Because the class is so bright.