Philosophy 57 — Day 13

- Quiz #3 Returned Thursday (Grader forgot to give them to me today)
  - Solutions posted now — will be discussed Thursday
  - "Curve" To Be Announced Thursday
- Mid-Term Next Tuesday (March 18th)
  - Will cover everything through today's lecture (*except* chapter 5)
  - Chapters 1, 3, 4 (just sections covered in class)
  - One 8.5×11 sheet (2-sided) of notes allowed for exam!
- Today: Translation from English to CL (section 4.7)
  - Last 5 Parts of Section 4.7
- Time Permitting: Introduction to Chapter 5
  - Categorical Syllogisms
  - Arguments in CL with two premises

Chapter 4: Categorical Statements — Translation from English Overview

- Many English claims can be translated faithfully into one of the four standard form categorical claims. There are 10 things to look out for.
  - Terms Without Nouns ✓
  - Nonstandard Verbs ✓
  - Singular Propositions ✓
  - Adverbs and Pronouns ✓
  - Unexpressed Quantifiers ✓
  - Nonstandard Quantifiers ✓
  - Conditional Statements
  - Exclusive Propositions
  - "The Only"
  - Exceptive Pronouns
- You do not need to remember the names of these 10 watchwords, but you'll need to know how to translate English sentences which involve them.

Chapter 4: Categorical Statements — Translation from English VI

- Nonstandard Quantifiers: In English there are many types of quantifiers. In categorical logic, there are only two. Nonstandard quantifiers must be translated into standard quantifiers in a way that best preserves meaning.
  - "A few soldiers are heroes" becomes "____ soldiers are heroes"
  - "Not everyone who votes is a Democrat" becomes ____?
  - "Not a single dog is a cat" becomes ____?
  - "All newborns are not able to talk" becomes ____?
  - "All athletes are not superstars" becomes ____?
- Sometimes, more than one categorical claim will be required to capture the meaning of an English sentence with a nonstandard quantifier:
  - "A small percentage of the sailors entered the regatta" becomes ____?
  - "Few marriages last a lifetime" becomes ____?

Chapter 4: Categorical Statements — Translation from English VII

- Conditional Statements: Conditional statements can often be translated into universal categorical claims.
  - "If it's a mouse, then it's a mammal" becomes "All mice are mammals"
  - "If an animal has four legs, then it's not a bird" becomes ____?
- When the "if" occurs in the middle of a sentence, we need to move it to the beginning, then translate into a universal claim:
  - "A person will succeed if he or she perseveres" becomes "If a person perseveres, then they will succeed" and then "All persons who persevere are persons who will succeed."
  - "Jewelry is expensive if it is made of gold" becomes ____?
- The key is to preserve the meaning of the conditional. A helpful rule about conditionals is called transposition, which says that "If p, then q" is equivalent to "If not q, then not p". (looks like *contraposition*!)

  - "If something is not valuable then it is not scarce" becomes (by transposition) "If something is scarce then it is valuable" and then ____?

- Whenever you see "*p unless q*", you can read this as "*p if not q*".
  - "Tomatoes are edible unless they are spoiled" becomes "If a tomato is not spoiled then it is edible." and then ____?
  - "Unless a boy misbehaves he will be treated decently" becomes ____ and then ____?

Chapter 4: Categorical Statements — Translation from English VIII

- Exclusive Propositions: Many propositions involve the words "only", "none but", "none except" and "no . . . except" are exclusive propositions. We must be careful to get the subject and predicate terms right in such examples. It helps to translate into a conditional statement first, then into a universal categorical statement:
  - "Only elected officials will attend the convention". Which is correct: "All elected officials are persons who will attend the convention" or "All persons who will attend the convention are elected officials"?
  - "None but the brave deserve the fair". Which is correct: "All persons who deserve the fair are brave persons" or " All brave persons are persons who deserve the fair"?
  - "No birds except peacocks are proud of their tails."
  - **General hint**: "Only *A* are *B*" becomes "All *B* are *A*". The same goes for "none but . . . " and "no . . . except".

Chapter 4: Categorical Statements — Translation from English IX & X

- "The Only": "The only *A* are *B*" gets translated as "All *A* are *B*". Note "*the* only" is different than "Only" in this sense.
  - "The only animals that live in this canyon are skunks" becomes "All animals that live in this canyon are skunks".
  - "Accountants are the only ones who will be hired" becomes ____ and then ____?
- Exceptive Propositions: Statements of the form "All except *S* are *P*" require *two* categorical statements for proper translation.
  - "All except students are invited" becomes "No students are invited persons, *and* ____".
  - "All but managers must report to the president" becomes ____ *and* ____?

Chapter 4: Categorical Statements — Translation from English: Table of Hints

Key Word (to be eliminated)	**Translation Hint**
Proper names (specific individuals)	*Parameterize*, and use "all" or "no"
whoever, wherever, always, anyone, never, etc.	use "all" or "no", together with persons, places, times
a few	"some"
if . . . then	use "all" or "no"
unless	"if not"
only, none but, none except, no . . . except	use "all" and switch order of terms
the only	"all"
all but, all except, few	two statements required (an **I** *and* an **O**)
not every, not all	"some . . . are not"
there is, there are	"some"

Chapter 5: Categorical Syllogisms I

- A Categorical Syllogism is an argument in categorical logic which contains exactly two premises and three terms. Here's a simple example:

  All soldiers are patriots. (All S are P.)
  No traitors are patriots. (No T are P.)
  Therefore, no traitors are soldiers. (No T are S.)

- The three terms in a categorical syllogism (CS) each have names:
  - The major term is the predicate term of the CS's conclusion.
  - The minor term is the subject term of the CS's conclusion.
  - The middle term is the remaining term in the CS.
- In our simple example above, which are the major, minor, middle terms?
- The premises in a CS also have names (which are which in our example?):
  - The major premise is the premise containing the major term.
  - The minor premise is the premise containing the minor term.

Chapter 5: Categorical Syllogisms II

- A categorical syllogism said to be in standard form iff:
  1. All three statements are standard-form categorical propositions.
  2. The two occurrences of each term are identical.
  3. Each term is used in the same sense throughout the argument.
  4. Order: major premise first, minor premise second, conclusion third.
- The following syllogisms are *not* in standard form (why?):

Anyone who led America into the space age will live in history. John Glenn led America into the space age. Therefore, John Glenn will live in history.	All P are non-W. Some E are W. Therefore, Some non-P are non-E.
No men are pregnant animals. All human beings are men. $\therefore$ No human beings are pregnant animals.	All W are P. Some W are M. Therefore, Some P are M.

Chapter 5: Categorical Syllogisms III

- The mood of a categorical syllogism consists of the letter names of the categorical propositions that make it up (in order).
  - Example: if the major premise is an **A** claim, the minor premise is an **O** claim, and the conclusion is an **E** claim, then the *mood* of the CS is **AOE**.
- The figure of a categorical syllogism is determined by the location of the two occurrences of the middle term in the premises. Four possible arrangements:

Figure 1	**Figure 2**	**Figure 3**	**Figure 4**
$M\ P$	$P\ M$	$M\ P$	$P\ M$
$S\ M$	$S\ M$	$M\ S$	$M\ S$
$\therefore S\ P$	$\therefore S\ P$	$\therefore S\ P$	$\therefore S\ P$

- What are the mood and figure of the following categorical syllogisms?

No P are M.	No P are M.	Some P are M.
Some M are S.	All S are M.	All M are S.
$\therefore$ Some S are not P.	$\therefore$ No S are P.	$\therefore$ Some S are P.

Chapter 5: Categorical Syllogisms IV

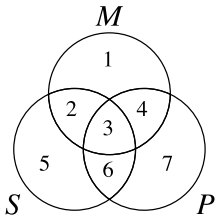
- The form of a categorical syllogism is determined by its mood and its figure. For instance, the form of the following categorical syllogism is **EAE**-4:

  No P are M.
  All S are M.
  $\therefore$ No S are P.

- Since there are 4 kinds of categorical propositions and there are 3 categorical propositions in a categorical syllogism, there are $4^3 = 4 \times 4 \times 4 = 64$ moods.
- Since there are 4 different figures and 64 different moods, there are grand total of $4 \times 64 = 256$ different forms of categorical syllogisms.
- The validity of a categorical syllogism is determined entirely by its form.
- As it turns out, exactly 15 of the 256 forms are valid (the rest are invalid).
- Hurley gives a list of the valid forms (page 245). You will *not* need to remember this list. We'll use (3-circle) Venn Diagrams to determine validities.

Chapter 5: Categorical Syllogisms V

- Because categorical syllogisms involve 3 terms, Venn Diagrams for categorical syllogisms will require 3 circles. We draw them like this:



- As was the case with our 2-circle diagrams, we will need some conventions for marking these 3-circle Venn Diagrams for categorical syllogisms.
- The basic rules are the same as before. If a region is empty, then we shade it, and if a region is non-empty, then we put an "X" in it (the precise placement of "X"s will be a little more subtle in the 3-circle case). Work lots of examples!