The key themes of this chapter are:

(1) What an analogy is;
(2) Analogies serve as the basis of a distinct type of argument, but not all analogies are the basis for argument; some are expository devices and others serve in explanations, for instance.
(3) The difference between *a priori* (or logical) and inductive analogies; students still uneasy with the term *a priori* can be referred back to Chapter 5.
(4) The importance of identifying the *primary subject* (the main topic/what the conclusion is about) and the *analogue* in order to understand the analogy. (There may, in some cases, be more than one analogue.)
(5) The need to use the notion of *relevance* when examining similarities and differences between the primary subject and the analogue.
(6) The fact that for inductive analogies, the facts about the cases are important and tend to cumulate in significance.

Arguments from analogy

Arguments from analogy are founded on the principle of consistency: similar cases ought to be treated similarly. When one concludes that things which are similar in observed ways are also similar in some further as yet unobserved respect, one uses an argument from analogy.

For example, analogical reasoning from the observed effects of birth control hormones on apes (which are physiologically very similar to humans) can be used to conclude that birth control pills may affect humans similarly.

- Not all analogies are arguments. Analogies can also be used to describe, illustrate, explain.
- In literature analogies go by the name of similes and metaphors.
- Analogies are used in teaching to illustrate or explain points or they make speech or writing more interesting.
- Medical research and archaeology are sciences which depend heavily on arguments from analogy.
- Archaeologists observe that people who are now living use items similar in form to those found in archaeological excavations. On the basis of these observed similarities, archaeologists infer by analogy that the prehistoric items were used in a similar way.
- Analogy plays an important role in moral reasoning. That is, when one claims that a certain act deserves blame, one might want to show that the act is relevantly similar to other actions that are quite clearly classified as blameworthy.
Arguments from analogy typically function by drawing a comparison between two or more similar things and have the following structure:

\[
\begin{align*}
\text{a, b, c, d all have the attributes P and Q.} \\
\text{a, b, c all have the attribute R.} \\
\text{therefore,} \\
\text{d probably has the attribute R.}
\end{align*}
\]

All analogies have two basic parts:

1. **Analogue (sample)**: the thing to which the primary subject is compared, usually agreed on and relatively easy to understand.
2. **Primary subject (target population)**: the central topic dealt with in the conclusion, usually less clear.

There are two distinct types of argument from analogy:

1. **A priori analogies**: (common in ethics, law, and in matters of classification) form the basis for decisions premised upon consistency considerations. The analogue may be a real case or an imaginary, hypothetical case. It should be a case about which our attitude is clear and must be consistently described.

**For Example: The Argument from Abortion**

[W]e grant that the fetus is a person from the moment of conception. How does the argument [against abortion] go from here? Something like this, I take it. Every person has a right to life. So the fetus has a right to life. No doubt the mother has a right to decide what shall happen in and to her body; everyone would grant that. But surely a person's right to life is stronger and more stringent than the mother's right to decide what happens in and to her body, and so outweighs it. So the fetus may not be killed; and abortion may not be performed.

But now let me ask you to imagine this. You wake up in the morning and find yourself back to back in bed with an unconscious famous violinist. He has been found to have a fatal kidney ailment, and the Society of Music Lovers has [...] kidnapped you, and last night the violinist's circulatory system was plugged into yours so that your kidneys could be used to extract poisons from his blood as well as your own. The director of the hospital now tells you: "Look, we're sorry the Society of Music Lovers did this to you - we would never have permitted it if we had known. But still, they did it and the violinist now is plugged into you. To unplug you would be to kill him. But never mind, it's only for nine months. By then he will have recovered from his ailment and can safely be unplugged from you."
Is it morally incumbent on you to accede to this situation? No doubt it would be very nice of you if you did, a great kindness. But do you have to accede to it?

If anything in the world is true, it is that you do not commit murder, you do not do what is impermissible, if you reach around to your back and unplug yourself from that violinist to save your life.

(From J. J. Thomson, "A Defense of Abortion", Philosophy and Public Affairs 1, no. 1 (1971)).

2. **Inductive analogies**: (common in history, medicine, and science) form the basis for predictions or retrodiction. The analogue must be something that now exists or did exist and its factual, empirical properties must be accurately described.

**For Example:**
Simple appliances like toasters and washing machines break down. They are not completely reliable. The same companies that make these appliances make nuclear reactors, which are much more complicated. It is very likely, then, that nuclear reactors will also be susceptible to breakdowns.

**Primary Subject:** Nuclear Reactors.

**Analogue:** Simple appliances like toasters and washing machines.

In what way are the primary subject and analogue similar? Nuclear reactors are made by the same companies that make toasters and washing machines.

**Assessing arguments from analogy**

1. Identify the various parts of the analogy and standardize the argument.
   
   - Determine if you have an argument.
   - Identify the conclusion and the primary subject, generally the topic of the conclusion.
   - Identify the analogue, that to which the primary subject is being compared.
   - Identify the ways in which the primary subject is said to be similar to the analogue.
   - Identify any additional information which may be given about the analogue.

2. Are the premises acceptable?
-One or more premises will assert that the primary subject is similar in some respects to the analogue. Is it in fact similar in the ways asserted?
-Additional information will be given about the analogue and possibly about the primary subject. Is all of this information accurate?

3. Are the similarities between the analogue and primary subject relevant to the point being made in the conclusion? The premises will highlight various features of the primary subject which it shares with the analogue. Are those features relevant to the point being defended in the conclusion? A similarity or shared characteristic is relevant if it appears to make the conclusion at least somewhat more likely than otherwise.

The issue of relevancy is very important in an analogy. Consider:

In support of the conclusion that Smith's new car will give good mileage, we adduce as evidence the fact that Jone's new car, which is known to give good mileage, is the same make and model, that is, it has the same number of cylinders, the same body weight, and the same horsepower as Smith's.

These are relevant considerations. Contrast this argument with one that draws the same conclusion from different premises.

In support of the conclusion that Smith's new car will give good mileage, we adduce as evidence the fact that Jone's new car, which is known to give good mileage, is the same color, the same number of gauges on their dashboards, and the same style of upholstery in their interiors.

This latter argument is much weaker. The reason why the first is a good argument and the second is not is that the factors in the first argument are relevant to mileage while those of the second are irrelevant.

4. First, you must determine if there are any relevant dissimilarities between the primary subject and the analogue.

A dissimilarity is relevant if it makes less likely the particular similarity asserted in the conclusion of the argument. If the truth of the dissimilarity tends to undermine the conclusion or counts toward its being false, then the dissimilarity is relevant.
Second, determine if the premises provide strong or weak support for the conclusion. If the similarities outweigh and are more significant than the dissimilarities the argument is strong. If the dissimilarities outweigh and are more significant than the similarities, the argument is weak.

**Assessing Arguments from Analogy: An Example**

Simple appliances like toasters and washing machines break down. They are not completely reliable. The same companies that make these appliances make nuclear reactors, which are much more complicated. It is very likely, then, that nuclear reactors will also be susceptible to breakdowns.

*Primary Subject:* Nuclear Reactors.

*Analogue:* Simple appliances like toasters and washing machines.

In what way are the primary subject and analogue similar? Nuclear reactors are made by the same companies that make toasters and washing machines.

**A possible standardization**

1. Simple appliances like toasters and washing machines break down and are not completely reliable.
2. The same companies that make these appliances make nuclear reactors.
3. Nuclear reactors are more complicated than these simple appliances.
   
   Therefore,
4. It is likely that nuclear reactors will be susceptible to breakdowns.

**Assessing the argument**

1. Are the premises acceptable? The first premise is acceptable by virtue of common knowledge. The second premise asserts that the primary subject and the analogue are similar in that both are made by the same companies. This is acceptable. Companies like General Electric and Westinghouse make both nuclear reactors and simple appliances. Premise three is acceptable by virtue of common knowledge.

2. Is the similarity relevant to the point being defended in the conclusion? The conclusion has to do with susceptibility to breakdowns. One thing relevant to knowing how susceptible something is to breakdowns is who manufactured it. So the similarity is relevant.

3. Are there any dissimilarities? There may be more governmental regulation in the nuclear reactor industry that in the small appliance industry. While the same companies may
manufacture both, chances are that they are not manufactured by the same division. Employees in the nuclear reactor division may be better trained than in the small appliances division.

4. Do the premises provide weak or strong support? The number of dissimilarities outweigh and seem more significant than the similarities. This is a weak analogy and so is not cogent. While we might be inclined to accept the conclusion, we shouldn't on the basis of the evidence provided.

**Writing arguments from analogy**

The key to writing a good argument by analogy is thinking up an appropriate analogue, one that is truly similar in relevant respects to the subject of your argument and one that will yield the conclusion you want to justify. Here are the steps in the process, illustrated by the step-by-step construction of an argument about skin cancer and the destruction of the ozone layer.

1. Be clear in your own mind about the claim you want to defend. Write the claim down to be sure you have it clearly in mind.

   The hole in the ozone layer over Europe and New England will result in increased incidence of cataracts and skin cancer.

2. Then, look for good reasons to back up the claim. What is it about the hole in the ozone layer that makes an increase in these diseases likely?

   The hole will allow more ultraviolet light to reach people on the ground.

3. Then, brainstorm: Under what circumstances has ultraviolet light reached living beings and caused increased rates of disease.

   Mice exposed to ultraviolet rays at an intensity like that expected to reach Europe and New England showed a tenfold increase in the incidence of cataracts and the mutations in cell structure that cause skin cancers.

4. Then you are in a position to compile the pieces of an argument by analogy, by these steps:

   a. Make clear what two things are being compared.
      The people who live under the hole in the ozone are compared to mice exposed to high levels of ultraviolet radiation in laboratory experiments.
   b. Explain how they are similar.
Mice and human beings have similar cellular structures. And they are exposed to similar rates of ultraviolet radiation.

c. State what is already known about the familiar case.
   Mice exposed to the higher levels of ultraviolet light showed a tenfold increase in the incidence of cataracts and the mutations in cell structure linked to skin cancers.

d. Draw the conclusion.
   It is likely that people who are also exposed to higher levels of ultraviolet radiation will also experience higher rates of cataracts and skin cancer.

5. Then, put the pieces of the argument together:

   Residents of Europe and New England, living under a new hole opening in the ozone layer, find themselves in a position similar to that of mice exposed to high levels of ultraviolet radiation in the laboratory. Both are being exposed to far higher levels of radiation than are normal. The mice showed a tenfold increase in the incidence of cataracts and mutations in cell structure that cause skin cancers. Thus, given the cellular similarities between humans and mice, it is likely that the damage to the ozone layer will result in increased incidence of eye and skin diseases among the residents of those areas.

6. To be sure that all parts of the argument are present and clearly identifiable, check a draft of your argument and, if necessary, revise it to make the argument clearer.