CHAPTER 2

What Are Arguments, and How Should We Evaluate Them?

1. Introduction

You probably know people who have profoundly different worldviews from you and profoundly different views about how to lead a good life. Perhaps you disagree whether there is a god, whether it's okay to eat meat, or whether morality is objective. Philosophy is a conversation about questions like these; a conversation between people with very different personal convictions. In philosophy, evocations of personal feelings are usually of little value because people's feelings about philosophical questions differ so greatly. Appeals to authority and tradition are not much better: one person's revered authority is another person's discredited blowhard.

So what is to be done? The short answer is that philosophers present **arguments** for their views.

Sometimes, the word "argument" is used to mean *dispute* or *debate* or *quarrel*. That's not what we mean. An argument, in our sense, is an attempt to justify some conclusion by rational means. Here is an example:

> The quality of government in a country correlates positively with voter turnout: the greater the voter turnout, the better the government. Therefore, low voter turnout causes bad government. So if you're eligible and you fail to vote, you make the government worse. What's more, democracy can only persist if enough people turn out

> to vote; therefore, if you're eligible to vote and you don't do so, you imperil democracy itself. It follows that if you're eligible to vote, it's morally wrong for you not to do so.

The **conclusion** of this argument is that if a person is eligible to vote, then it's morally wrong for her not to do so. If you are unconvinced, you should be able to articulate *where* exactly you think the argument fails. And perhaps you should back up your claims by presenting arguments of your own . . . and so the conversation that is philosophy continues.

In this chapter, we discuss the structure of arguments, and we talk about how to evaluate arguments. It will help to use simple examples; indeed, some of our examples may seem rather goofy. But please don't be put off: there's nothing goofy about the techniques we describe in this chapter. We're describing the methods of the world's foremost philosophers.

2. Premises and Conclusions

Here is the simplest argument you'll find in this book:

> No elephant is a reptile. Jumbo is an elephant. Therefore, Jumbo is not a reptile.

The conclusion of this argument is that Jumbo is not a reptile. The other two statements are **premises**—these are statements that the writer assumes while making her case for the conclusion. The premises are the starting points of the argument. Sometimes it's helpful to write an argument in this form, with a horizontal line separating the premises from the conclusion:

> No elephant is a reptile.
>
> Jumbo is an elephant.
>
> ---
>
> Jumbo is not a reptile.

The advantage of presenting arguments this way is that it makes it explicit what the conclusion of the argument is and what the premises are

Here is another example:

> Fido didn't come in through the cat flap: it's tiny, and Fido is a large dog.

In this case the writer assumes that the cat flap is tiny and that Fido is a large dog; these are his premises. He infers that Fido could not have come in through the cat flap; this is his conclusion.

> The cat flap is tiny.
>
> Fido is a large dog.
>
> Fido didn't come in through the cat flap.

Sometimes a writer will add extraneous comments to an argument:

> One of you ate the cookies, for Pete's sake! Since you all deny it—which is infuriating—one of you must be lying. (Why do we have to do this every week?)

The argument in this passage is this:

> One of you ate the cookies.
>
> Each of you denies having eaten the cookies.
>
> One of you is lying.

"For Pete's sake," "which is infuriating," and "Why do we have to do this every week?" are not parts of the argument; they are mere asides.

Sometimes a writer will explicitly identify her conclusion and premises. Very often, however, it takes some effort on the part of the reader to find them. There are certain giveaway words and phrases often used to mark the conclusion of an argument. For example:

therefore	hence
consequently	so
in conclusion	thus
it follows that	necessarily
then	we infer that
implies that	

Consider for example this argument:

> If taxes are not increased, the budget deficit will become very large. We should not let the budget get out of control. Thus, taxes should be raised.

The word "thus" indicates that "taxes should be raised" is the conclusion. The other two sentences are premises.

Another way of marking the conclusion of an argument is to use the verb "must." For example:

> Jonathan *must* be home because his car is in the driveway.

The conclusion of this short argument is that Jonathan is home; the premise is that Jonathan's car is in the driveway.

There are also certain giveaway words and phrases in English that a writer can use to indicate that some statement is a premise:

I suppose that	it is assumed that
since	because
for	as
on the grounds that	for the following reason
follows from the fact that	given that
may be inferred from the fact that	

Consider for example this argument:

> Alan must have burnt the bagel because there is smoke in the kitchen.

The word "because" indicates that "there is smoke in the kitchen" is a premise. "Alan burnt the bagel" is the conclusion.

Sometimes a writer will not use giveaway expressions. For example:

> John stole the laptop. It was either John or Ashni, and Ashni would never steal.

There are no giveaway words here, so we just have to apply common sense to figure out what's the conclusion of the argument and what the premises are.

> It was either John or Ashni who stole the laptop.
>
> Ashni would never steal.
>
> ---
>
> John stole the laptop.

Look at these arguments. In each case, identify the premises and the conclusion:

(a) Tom was at the party, for sure. He must have been drinking because *everybody* at the party was drinking.
(b) Everyone who lives in Snooty Towers is stuck up. Mehdi lives in Snooty Towers. Therefore, Mehdi is a snob.
(c) You should stop dating James. He swears at strangers in the street, he never leaves a tip when he goes to a restaurant, and his breath smells.
(d) The walking stick won't be very useful to Li Na: the stick is rather short, and she is very tall.
(e) A long holiday would be better for both of us, so we should go for it!

3. Evaluating Arguments

When evaluating an argument, it is important to think about two questions. First: Are the premises of this argument true? Second: Assuming that the premises are true, to what extent do they support the conclusion? Here is an example:

> Diet soda drinkers are more likely to be obese than people who do not drink diet soda.
>
> ---
>
> Drinking diet soda causes obesity.

There is some evidence that the premise of this argument is true, at least in the United States.[1] Nevertheless, we don't think that this is a good argument. As the cliché goes, "correlation doesn't imply causation": even if it is true that there is a correlation between diet soda drinking and obesity, it doesn't follow that drinking diet soda causes obesity. After all, it might be the other way around: perhaps the correlation exists because people who put on weight respond by drinking diet soda.

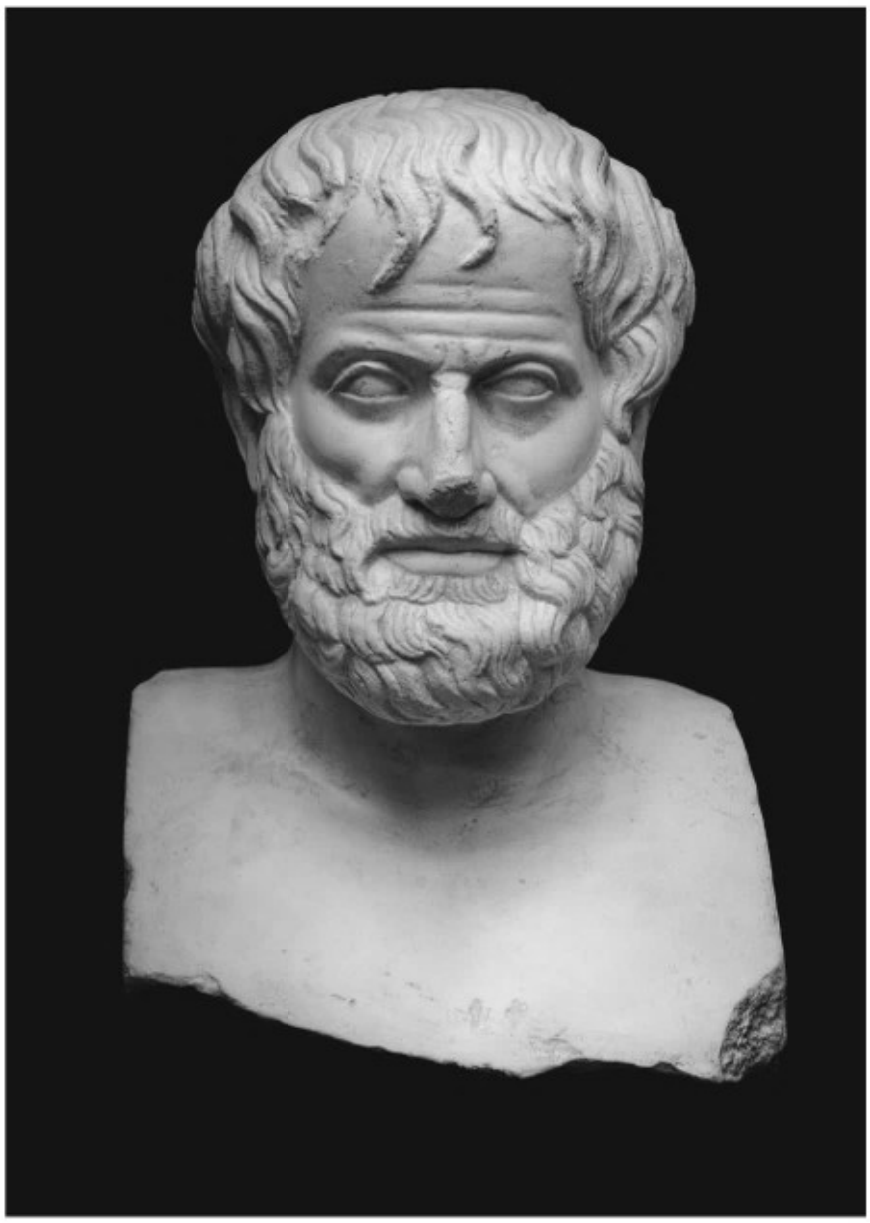
In saying that this is a bad argument, we are not denying the truth of its conclusion. Some public health experts have argued that drinking diet soda causes obesity, and we do not dispute their claim. We claim only that this argument, as it stands, does little to support their position. This illustrates an important point: a bad argument can nevertheless have a true conclusion. Don't confuse the question "Is this a good argument?" with the question "Do you agree with this writer's conclusions?"

Have a look at these arguments. In each case, consider the two crucial questions: Are the premises of this argument true? and Do the premises of the argument, if true, support the conclusion?

(f) Any person born in the United States is eligible for US citizenship.
Tom Cruise is a US citizen.
Tom Cruise was born in the United States.

(g) Every octopus is a cephalopod.
No cephalopod has a spine.
No octopus has a spine.

(h) Extraterrestrial life has never been observed.
There is no extraterrestrial life in our galaxy.



Aristotle (384–322 BCE) made seminal contributions to the theory of logic.

4. Deductive Validity

Here is another argument for you to evaluate. Think about it before reading on:

> The population of Kenya is less than 70 million.
>
> The population of Nigeria is more than 150 million.
>
> The population of Nigeria is more than the population of Kenya.

Even if you don't know whether the premises of this argument are true, you should be able to see that *if* the premises are true, *then* the conclusion must be true as well. If the premises are true, this guarantees the truth of the conclusion. The argument is, to use the jargon, **deductively valid** (or just "valid" for short).

Here are some more examples:

Lou owns a dog, and he owns a cat.

Lou owns a dog.

Everyone at the party is married.

John is at the party.

John is married.

Ashni is married to Jo.

Jo is married to Ashni.

In every case, it is guaranteed that *if* the premises are true, the conclusion must be true as well.

This is an argument that is *not* valid:

Desiree eats sushi for lunch every day.

Desiree likes the taste of sushi.

This argument is not valid because the truth of the premise doesn't *guarantee* the truth of the conclusion. Even if it's true that Desiree eats sushi for lunch every day, it might nevertheless be false that she likes the taste of sushi—perhaps she only eats sushi because her doctor advised it.

An argument is said to be "sound" if it is valid *and* has true premises.

Take a look at these arguments. Which are valid?

(i) Mei is either at the store or at home.

Mei is not at home.

Mei is at the store.

(j) Tiki is a bird.

Tiki can fly.

(k) Everyone who can run 100 meters in less than eleven seconds is on the team.

Ella is on the team.

Ella can run 100 meters in less than eleven seconds.

5. Induction and Abduction

Deductively valid arguments are important, especially in mathematics. But arguments that are not valid can be very persuasive too.

Suppose that you are a zoologist studying a newly discovered type of bird (the "snocker bird," let's say). You do this by making observations of some sample of snocker birds and drawing conclusions about snocker birds in general. For example, you might argue the following:

All the snocker birds in my sample have green heads.

All snocker birds have green heads.

Is this argument convincing? This depends on the sample. If your argument is to be convincing, you need a large enough sample: it is not enough to observe only two or three snocker birds. Your sample must also be *varied:* you should observe both male and female snocker birds; you should observe snocker birds of different ages; you should observe snocker birds from different places and at different times of the year; and so on. Assuming that your sample is sufficiently large and varied, however, the argument is persuasive.

Even so, the argument about the snocker birds isn't deductively valid. Even if you studied a large and varied sample of snocker birds, all of which were observed to have green heads, it remains possible (though perhaps unlikely) that some snocker birds outside the sample do not have green heads. This illustrates the point that not all persuasive arguments are deductively valid.

The argument about the snocker birds is an example of **enumerative induction** (or induction for short). In an inductive argument, you start by identifying some pattern in cases that have been studied; you suggest on this basis that the pattern will extend to other cases as well.

Here are some further examples:

Every cake I have bought from Tina's Café has been stale.

Most of the cakes sold at Tina's Café are stale.

So far, no emperor penguin has been seen to lay more than one egg in a year.

Emperor penguins lay no more than one egg in a year.

I've met several of John's friends, and they have all been soccer enthusiasts.

Sean is John's friend.

Sean is a soccer enthusiast.

Every dog I have owned has been badly behaved.

The next dog I own will be badly behaved.

We will further discuss enumerative induction in chapter 7. In that chapter, we focus on cases in which induction is used to make a prediction based on past observations. For example, in New York City, every year so far it has been true that on average it is hotter in July than in February. And so, by induction, we anticipate that next year in New York, July will be on average hotter than February.

Now let's talk about **abduction**. When one gives an abductive argument, one starts with a number of observations, and one puts forward an explanation for the observations. If one judges that the proffered explanation is a good explanation and better than any available alternatives, one cautiously infers that the explanation is correct.

Let's look at an example. Suppose that you wake up one morning and find, to your surprise, that on the kitchen table there is a used bowl, an open carton of milk, and an open box of cereal. It occurs to you that this might be because your roommate overslept, had breakfast, and then rushed out of the house, not having enough time to clean up.

If this strikes you as more credible than any other explanation, you are likely to conclude that your explanation is correct:

There is a used bowl, an open carton of milk, and an open box of cereal on the kitchen table.

My roommate overslept.

This sort of argument is often called **inference to the best explanation**, for obvious reasons.

Many philosophers believe that scientific theories are commonly supported by abduction. Newton's theory of gravitation is a plausible example. Newton started with a collection of observations: observations of the motions of cannonballs, the planets, the moon, the tides, and so on. He found that he could explain all of these observations using his theory of gravitation. Since this was better than any other explanation available at the time, the theory was accepted.

(l) Give two more examples of enumerative induction.
(m) Give one more example of abduction.
(n) Give another example of the use of abduction in the sciences.

6. Multistep Arguments

Have a look at these two arguments:

All frogs are amphibians.	Fernando is an amphibian.
Fernando is a frog.	All amphibians are vertebrates.
Fernando is an amphibian.	Fernando is a vertebrate.

Notice that the conclusion of the left-hand argument is the same as one of the premises of the right-hand argument. You might want to join these two arguments together to make one longer argument.

Multistep arguments like this are hard to present clearly. One way is to number the statements and use marginal comments to explain how the statements are related:

(1)	All frogs are amphibians.	(Premise)
(2)	Fernando is a frog.	(Premise)
(3)	Fernando is an amphibian.	(From 1, 2)
(4)	All amphibians are vertebrates.	(Premise)
(5)	Fernando is a vertebrate.	(From 3, 4)

Here is another multistep argument:

> If it was the taxi driver who murdered the drummer, there would have been blood on the seats of the taxi. But there was no blood in the taxi. It was either the taxi driver or the roadie who murdered the drummer. Since it can't have been the taxi driver, it must have been the roadie.

It is clear that the final conclusion of this argument is that the roadie murdered the drummer. The writer reaches this conclusion by saying that the murderer was either the taxi driver or the roadie, but it wasn't the taxi driver:

> It was either the taxi driver or the roadie who murdered the drummer.
>
> The taxi driver didn't murder the drummer.
>
> The roadie murdered the drummer.

The writer backs up the second premise of this argument with another argument:

> If it was the taxi driver who murdered the drummer, there would have been blood on the seats of the taxi.
>
> There was no blood in the taxi.
>
> The taxi driver did not murder the drummer.

Putting the two parts of the argument together, we get:

(1)	If it was the taxi driver who murdered the drummer, there would have been blood on the seats of the taxi.	(Premise)
(2)	There was no blood in the taxi.	(Premise)
(3)	The taxi driver didn't murder the drummer.	(From 1, 2)
(4)	It was either the taxi driver or the roadie that murdered the drummer.	(Premise)
(5)	The roadie murdered the drummer.	(From 3, 4)

Now let's at look at an argument that is more complex and philosophically interesting. You may recognize this passage from the beginning of the chapter. (Note that "voter turnout" is the percentage of eligible voters who cast a ballot in an election.)

> The quality of government in a country correlates positively with voter turnout: the greater the voter turnout, the better the government. Therefore, low voter turnout causes bad government. So if you're eligible, and you fail to vote, you make the government worse. What's more, democracy can only persist if enough people vote; therefore, if you're eligible to vote and you don't do so, you imperil democracy itself. It follows that if you're eligible to vote, it's morally wrong for you not to do so.

The writer's conclusion is, "if you're eligible to vote, it's morally wrong for you not to do so." She provides two reasons for accepting this conclusion: first, she argues, "if you're eligible, and you fail to vote, you make the government worse." Second, she argues, "if you're eligible to vote and you don't do so, you imperil democracy itself." So part of the argument is this:

> If you're eligible and you fail to vote, you make the government worse.
>
> <u>If you're eligible to vote and you don't, you imperil democracy itself.</u>
>
> If you're eligible to vote, it's morally wrong for you not to do so.

The author backs up her contention that those who choose not to vote "make the government worse" by saying that low voter turnout causes bad government. She infers this latter claim from the observation that countries with greater voter turnout have better government.

The author backs up her contention that those who choose not to vote "imperil democracy itself" by claiming that "democracy can persist only if enough people vote."

Putting all this together, the argument is as follows:

(1)	The quality of government in a country correlates positively with voter turnout.	(Premise)
(2)	Low voter turnout causes bad government.	(From 1)
(3)	If you're eligible and you fail to vote, you make the government *worse*.	(From 2)
(4)	Democracy can only persist if enough people vote.	(Premise)
(5)	If you're eligible to vote and you don't do so, you imperil democracy itself.	(From 4)
(6)	If you're eligible to vote, it's morally wrong for you not to do so.	(From 3, 5)

Here are some multistep arguments for you to analyze.

(o) All the guys in ΓΔ are rude. John is in ΓΔ, so he's rude too. You shouldn't invite rude people to your parties, so John shouldn't be invited.

(p) Joe is often mean to me, so either he loves me or he hates me. I've done nothing to make him dislike me, so he loves me.

(q) Mr. Singh is at least fifty years old, since he was born in the 1950s. So he must be older than Min.

(r) Four, nine, sixteen, twenty-five, thirty-six, and forty-nine all have an odd number of factors. So *all* square numbers have an odd number of factors. Now 2,401 is square, so it has an odd number of factors.

(s) I only have ten dollars to spend. The starters at The Snail cost more than that, so that's out. I shouldn't take Amie to The Rose either, because they don't serve vegetarian food. Those are the only two restaurants open. So we should stay in tonight.

7. Evaluating Multistep Arguments

When you evaluate an argument, it's often a good idea to write out the argument as a series of numbered statements first. That way, if you criticize the argument, then you can be precise in your criticism: you can

say *exactly* where you think the argument goes wrong. To see how this works, let's take a look again at the argument about the supposed duty to vote from the last section.

(1)	The quality of government in a country correlates positively with the voter turnout.	(Premise)
(2)	Low voter turnout causes bad government.	(From 1)
(3)	If you're eligible and you fail to vote, you make the government worse.	(From 2)
(4)	Democracy can only persist if enough people vote.	(Premise)
(5)	If you're eligible to vote and you don't, you imperil democracy itself.	(From 4)
(6)	If you're eligible to vote, it's morally wrong for you not to.	(From 3, 5)

To evaluate the argument, we examine all six statements in turn.

1. To evaluate premise (1) properly, we would need to do some serious empirical research. We have no idea what the result of this research would be: we don't know whether premise (1) is true.
2. The inference from (1) to (2) is questionable. Suppose for the moment that the quality of government does indeed correlate positively with voter turnout. This *might* be because low voter turnout causes bad government—but this isn't clearly the correct explanation. Perhaps it works the other way around: when government is bad, this causes disillusioned voters to stay at home on the day of the election.
3. The inference from (2) to (3) is also questionable, which you can see by way of analogy. It may well be that, other things being equal, an increase in the number of cars on the road causes an increase in the number of traffic accidents. It doesn't follow that each individual driver causes an increase in the number of traffic accidents.
4. We are inclined to think that (4) is true: if voter turnout were persistently below some threshold in some country, the country could not continue to function as a democracy. However, it is not at all clear how many people are "enough"—that is, it's not clear how many need to vote to ensure democracy continues.

5. We don't think that (5) follows from (4). An eligible voter might reasonably protest, "in my country, it's clear that 'enough' people will vote, even if I do not. So if I choose not to vote, I do not imperil democracy."
6. The inference from (3) and (5) to (6) may seem strong, but we have a caveat to add. Suppose that, on election day, you failed to vote because you were doing some other important thing: perhaps you were putting out a fire or performing surgery. In this case, it seems, you were not obliged to vote. So perhaps the conclusion of the argument ought to be more nuanced: If you're eligible to vote, it's morally wrong for you not to do so, unless you have something more important to do on the day of the election.

Now for a second example:

> I assume that God exists. Then he is all-knowing, and he existed before you were born. Being all-knowing, before you were born God knew *everything* that would happen in your life. He could foresee your every action and every decision. It follows that your whole life was predetermined, and so none of your choices has been genuinely free. Thus, you don't have free will.

We encourage you to have a go at evaluating this argument before looking at our evaluation.

This is our analysis of this argument:

(1)	God exists.	(Premise)
(2)	God is all-knowing.	(From 1)
(3)	God existed before you were born.	(From 1)
(4)	Before you were born God knew *everything* that would happen in your life.	(From 2, 3)
(5)	It follows that your whole life was predetermined.	(From 4)
(6)	None of your choices has been genuinely free.	(From 5)
(7)	You don't have free will.	(From 6)

Now we can evaluate the argument. Once again, we do this by going through the steps one by one.

1. We won't say much about (1) here. We discuss the existence of God in chapters 3 and 4.

2. It has often been assumed in the past that God is all-knowing if he exists. Nevertheless, we could reject the inference from (1) to (2). We could endorse a revisionary version of theism, according to which God is not all-knowing.
3. The inference from (1) to (3) is more difficult to reject. It's hard to believe that God exists, but that he only came into existence during your lifetime.
4. An obvious definition of "all-knowing" is this: an omniscient being is a being who knows *everything*. Given this definition, (4) does seem to follow from (2) and (3). But we could reject this inference by insisting on a different definition of "all-knowing." Perhaps to be all-knowing is to know everything *which it is possible to know*. On this definition, it's not so obvious that (4) follows from (2) and (3).
5. If we accept (4) but reject (5), we'll end up with a view on which God knew all our actions in advance, but even so, those actions weren't predetermined. It's difficult to know whether this position is coherent: we'd need to think very carefully about what "predetermine" means to figure this out.
6. As we discuss in chapter 9, some philosophers (**compatibilists**) think that our having free will is compatible with **determinism**. Perhaps we could adopt a similar view, and say that our actions are free despite being predetermined. So the inference from (5) to (6) is not beyond dispute.
7. The inference from (6) to (7) looks solid. If there's a mistake in the argument, it isn't here.

8. Some Arguments to Evaluate

(t) Weather forecasts for the coming week or so are more or less accurate, but longer range weather forecasts are untrustworthy. Also, the longer the range of the forecast, the less trustworthy it is. When climate scientists make predictions about global temperatures over the next few decades, they are, in effect, issuing very long-term weather forecasts. So these predictions are not to be taken seriously.

(u) We all know that it is very difficult to lead a completely monogamous life. Even in the case of couples who are devoted to monogamy, so-called cheating is very common. Nevertheless,

most people continue to believe that monogamy should be our goal. I think that this is wrong. It is a mistake, I think, to live monogamously. Monogamy is rare in the animal kingdom. What's more, none of the species most closely related to humans are monogamous. This shows that monogamy is unnatural. Our problem is not that we fail to live up to the ideal of monogamy; our problem is that we make this our ideal in the first place.

(v) A given quantity of money is worth more to a poor person than to a rich person. (For example, for a rich person, $1,000 is a weekend in New York; for a poor person, $1,000 is the difference between going hungry and having enough to eat.) This means that if a quantity of money is taken from a rich person and transferred to a poor person, the loss of welfare to the rich person is smaller than the gain in welfare to the poor person. This means that a redistributive system of tax and benefits increases the average welfare level in society. The government's goal should be to increase the average level of welfare in society. And so the government should maintain a redistributive system of tax and benefits.

(w) Even among protagonists of a free market society, there are some who claim that markets are 'morally neutral.' This allegation constitutes a dangerous concession to the enemies of freedom. . . . In fact the judgement is comprehensively mistaken. Markets are not morally neutral. They both presuppose and generate virtue. . . . Moral action presupposes choice. Virtue entails an opportunity for vice foregone. . . . Thus morality is possible only in conditions of liberty. Without personal autonomy, I can do neither good nor evil. The free market is an essential component of the social structure of liberty, and ipso facto . . . an indispensable component of the social structure of virtue. . . . Markets are thus neither morally negative . . . nor even . . . morally neutral. They are, on the contrary, resoundingly and constitutively positive in their moral implications and effects . . . markets are one of the several indispensable preconditions of liberty, and as such are preconditions to any genuinely moral action. In the medium term, if not in the short term, no market, no freedom, no virtue. QED.[2]

9. Answers to Problems

Question (a)

Everyone at the party was drinking.

Tom was at the party.

Tom was drinking.

Question (b)

Everyone who lives in Snooty Towers is stuck up.

Mehdi lives in Snooty Towers.

Mehdi is a snob.

Question (c)

James swears at strangers in the street.

James never leaves a tip when he goes to a restaurant.

James's breath smells.

You should stop dating James.

Question (d)

The walking stick is short.

Li Na is very tall.

The walking stick won't fit Li Na.

Question (e)

A long holiday would be better for both of us.

We should have a long holiday.

Question (f)

The first premise of this argument is not *quite* true: there are exceptions to the principle that any person born in the United States is eligible for US citizenship. However, the larger problem with this argument is that the conclusion doesn't follow from the premises.

Question (g)

The premises of this argument are true, and the conclusion does indeed follow from the premises.

Question (h)

We take the premise of this argument to be true. There is room for dispute about the extent to which the premise supports the conclusion. For what it's worth, we don't find the argument very convincing. It doesn't seem unlikely that there are bacteria-like organisms on some distant planet in our galaxy that we are currently unable to observe.

Question (i)

The argument is valid.

Question (j)

The argument is not valid.

Question (k)

The argument is not valid.

Question (o)

(1)	All the guys in ΓΔ are rude.	(Premise)
(2)	John is in ΓΔ.	(Premise)
(3)	John is rude.	(From 1, 2)
(4)	You shouldn't invite rude people to your parties.	(Premise)
(5)	You shouldn't invite John to your party.	(From 3, 4)

Question (p)

(1)	Joe is often mean to me.	(Premise)
(2)	Either Joe loves me or Joe hates me.	(From 1)
(3)	I've done nothing to make Joe dislike me.	(Premise)
(4)	Joe loves me.	(From 2, 3)

Question (q)

(1)	Mr. Singh was born in the 1950s.	(Premise)
(2)	Mr. Singh is at least fifty years old.	(From 1)
(3)	Mr. Singh is older than Min.	(From 2)

Question (r)

(1)	Four, nine, sixteen, twenty-five, thirty-six, and forty-nine all have an odd number of factors.	(Premise)

(2)	All square numbers have an odd number of factors.	(From 1)
(3)	2,401 is square.	(Premise)
(4)	2,401 has an odd number of factors.	(From 2, 3)

Question (s)

(1)	I only have ten dollars to spend.	(Premise)
(2)	The starters at The Snail cost more than ten dollars.	(Premise)
(3)	I shouldn't take Amie to The Snail.	(From 1, 2)
(4)	The Rose doesn't serve vegetarian dishes.	(Premise)
(5)	I shouldn't take Amie to The Rose.	(From 4)
(6)	The only two restaurants open are The Snail and The Rose.	(Premise)
(7)	We should stay in tonight.	(From 3, 5, 6)

Question (t)

Weather forecasts made more than a week in advance are untrustworthy.

The longer the range of a forecast, the less trustworthy it is.

When climate scientists make predictions about global temperatures over the next few decades, they are in effect issuing very long-term weather forecasts.

Therefore:

Climate scientists' predictions about global temperatures over the next few decades are not to be taken seriously.

Question (u)

(1)	Monogamy is rare in the animal kingdom.	(Premise)
(2)	None of the species most closely related to humans are monogamous.	(Premise)
(3)	It is unnatural to live monogamously.	(From 1, 2)
(4)	It is a mistake to make monogamy our ideal.	(From 3)

Question (v)

(1)	A given quantity of money is worth more to a poor person than to a rich person.	(Premise)

(2)	If money is taken from a rich person and transferred to a poor person, the loss of welfare to the rich person is smaller than the gain in welfare to the poor person.	(From 1)
(3)	A redistributive system of tax and benefits increases the average level of welfare in society.	(From 2)
(4)	The government's goal should be to increase the average level of welfare in society.	(Premise)
(5)	The government should maintain a redistributive system of tax and benefits.	(From 3, 4)

Question (w)

(1)	An action is virtuous only if, in doing that action, the agent forwent the opportunity to do some other, vicious, action.	(Premise)
(2)	Virtuous action is possible only in "conditions of liberty."	(From 1)
(3)	Only in a market economy are we in conditions of liberty.	(Premise)
(4)	Virtuous action is possible only in a market economy.	(From 2, 3)
(5)	Markets presuppose and generate virtue.	(From 4)

What to Look at Next

There are many good books available on the analysis and evaluation of arguments. Often this field is called "informal logic." Walter Sinnott-Armstrong and Robert Fogelin's *Understanding Arguments: An Introduction to Informal Logic* is excellent; so is Richard Feldman's *Reason and Argument*. Anthony Weston's *A Rulebook for Arguments* is also excellent, though it is more about creating your own arguments than evaluating the arguments of other people. But we stress that learning to evaluate arguments is rather like learning to swim: reading is not enough; you have to practice. When you come across an argument, think of it as an opportunity to develop your analytical skills. Think as

carefully as you can about the internal structure of the argument, and then scrutinize each step in the argument individually.

Glossary

abduction: In an abductive argument, one starts with a number of observations, and one puts forward an explanation for the observations. If one judges that the proffered explanation is a good explanation and better than any available alternatives, one cautiously infers that the explanation is correct.

argument: Very often, the term "argument" is used to mean *dispute* or *quarrel*. This is not what the term means in this book. In our sense, an argument is an attempt to rationally justify some assertion—what is called the "conclusion" of the argument. Typically, when you make an argument, you take certain things for granted (these are your "premises") and you attempt to show that if one accepts the premises, one should accept the conclusion too.

compatibilist: Compatibilists believe that determinism is compatible with the claim that we have free will. See chapter 9 for discussion.

conclusion: When one makes an argument, one attempts to rationally justify some assertion. This assertion is the conclusion.

deductively valid: When an argument is deductively valid, the truth of the premises *guarantees* the truth of the conclusion: Given that the premises are true, the conclusion *must* be true as well.

determinism: According to determinists, given the state of the universe at any one time, the laws of physics fix the whole of the rest of history. So if you could "rewind" history and run it again from exactly the same starting point, history would be exactly repeated. See chapter 9 for discussion.

enumerative induction (or induction, for short): In an inductive argument, one starts by identifying some pattern in cases that have been studied; then one suggests on this basis that the pattern will extend to other cases as well. For example, if you buy a few cakes from Tina's Café, and they are all stale, you might infer that most or all the cakes that Tina sells are stale.

inference to the best explanation: See abduction.

premise: When you make an argument, typically you have to take certain things for granted. These are your premises.

Notes

1. Chee W. Chia et al., "Chronic Low-Calorie Sweetener Use and Risk of Abdominal Obesity among Older Adults: A Cohort Study." PLOS 11, no. 11 (2016): e0167241.
2. This is a *highly* abbreviated version of the opening of David Marsland's "Character, Liberty and Social Structure," in *Economy and Virtue*, ed. Dennis O'Keefe (London: Institute for Economic Affairs, 2004), 101–115.