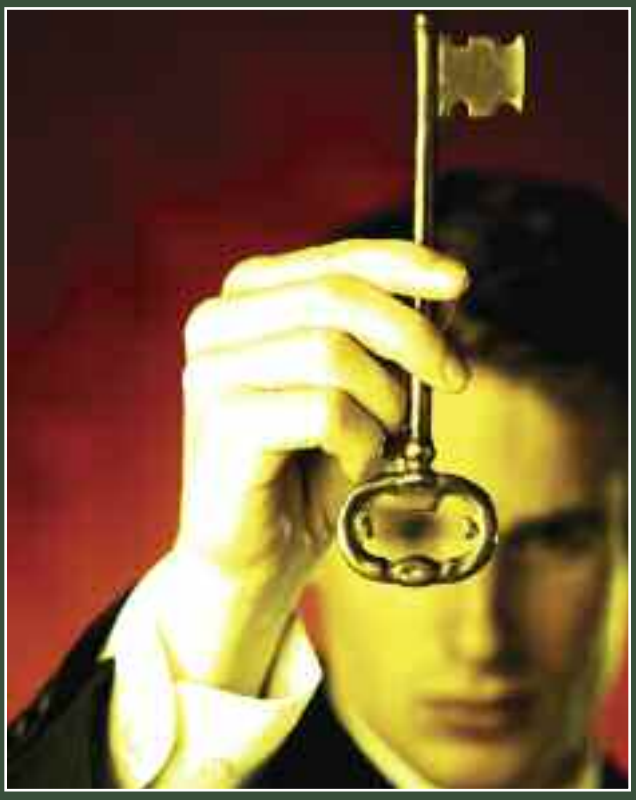
The Myth of the Closed Mind



Ray Scott Percival

The Myth of the Closed Mind

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Explaining Why and How People Are Rational

RAY SCOTT PERCIVAL

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For Grace Scott Percival

Brief Table of Contents

Detailed Table of Contents

Preface

For as long as I can remember I've respected the power of logical argument. I've always wanted to be persuasive on account of the validity of my arguments and when tempted to substitute an immediately attractive but unsound argument for a valid but slower-to-take-effect argument, I've always resisted the temptation. This struck me as not only the noble thing to do, but also prudent in the long run. If you adhere as best you can to the truth and to valid argument, then you're guided by principles that are always there for you as you navigate life, because they are universal. You will be like a captain at sea relying on the guidance of the fixed stars to navigate. If, on the other hand, you're guided by the momentary advantages of the impressive but bogus argument, you're lost in a sea without fixed stars. You will constantly have to learn (or create) new charts to navigate.

Suppose you're convinced that some people are just impervious to valid argument, that their minds are closed to reason, but that they may be amenable to poetic or humorous cajoling, ridicule, or even barefaced coercion. It's even more tempting then to ignore the civil give and take of sincere argument. But to succumb to that temptation is a large step to a barbaric or at least philistine world. I'm arguing in this book that the temptation is much less alluring than generally supposed, because it's based on the myth of the closed mind. On the other hand, the belief in the power of sound argument can become a force for civilization and freedom.

The problem of the closed mind has been with me for a long time. For a professional thinker it's important, but also rare, to find a problem with real depth. It is in the working out of the problem that a thinker produces his ideas and they can only be as deep as the problem they are meant to solve. I'm happy to have found such a problem. For me this

conundrum has been a fountain of further puzzles and enigmas that have stimulated many other fruitful ideas.

Because of the way I develop my argument, I like to think of this book as an ocean into which I invite you. In the Prologue, I walk with you down a gently inclined sandy beach to the water's edge. Even as you step into the water, the slope remains gentle and continues like this as you imperceptibly walk into deeper and deeper waters. Eventually, you will be swimming in deep water, but you'll feel in control and comfortable as you encounter slightly more difficult ramifications of my outrageous idea.

In this book, I present you with a bold thesis—I freely admit that it is outrageous—and then elaborate this by applying it to various issues, defending it against objections as I go. Though contrary to the fashion of much academic writing, this is, I believe, the best approach. Academia is almost hostage to the prevalent intellectual context, justificationism, the view that you should accept all and only those positions that are justified by experience or argument. Pick up almost any book on epistemology and its pages are likely to be exclusively dominated by chapters on justification. This intellectual context is associated with a style of presentation in which you must first marshal all your evidence, and only then announce your conclusion.

It's good to have competition, in ideas as anywhere else. Fortunately, there is a respectable alternative: the method of conjecture and refutation, otherwise known as critical rationalism. Critical rationalism is the view that truth, or closeness to the truth, and not justification is our aim. Our theories are unjustified and forever unjustifiable children of the imagination, against which we ought to marshal our best criticisms in the hope that those that survive will be at least closer to the truth.

I wish to acknowledge many friends and colleagues who have contributed to the intellectual context in which this book grew. There are times in life when one has what the psychologist Maslow calls a peak experience. One of my peak experiences was my encounter with true intellectuals—people feverishly interested in ideas, right or wrong. True intellectuals are quite rare. The first such intellectual I ever met was David McDonagh, whom I encountered while studying for my Master's in philosophy at the University of Warwick. David taught me the value of bold—almost aggressive—discussion. You couldn't really get far by searching for consensus as part of a misguided diplomacy in debate. Indeed, consensus always means the end of a productive episode of clashing ideas. Seeking consensus makes sense for business and negotiation, but debate isn't negotiation. Debate requires disagreement. So you

have to stick to your guns. Of course, criticism stings, but if you're prepared to take the stings, your ideas will develop into much stronger, more interesting creatures.

During my time at Warwick I also met other outstanding intellects who have provided much encouragement but also the occasional devastating criticism that stimulated the growth of my book: Jan C. Lester, David W. Miller, and David Ramsay Steele. Criticism can sting and they pull no punches—fortunately. Another thinker who pulled no punches was William Warren Bartley III. Bartley originated the philosophical theory of Comprehensively Critical Rationalism. Bartley was true to his principles and engaged in a spirited exchange of letters with me in which he tried to defend the closed mind thesis, the result being Chapter 4 of this book. David Deutsch, Jeremy Shearmur, and Mark Amadeus Notturno also gave me encouragement and stimulating criticism.

Later, I had the great pleasure of taking afternoon tea with Sir Karl Popper. We discussed my incipient thesis of the non-existence of the closed mind and my exchange with Bartley on this topic, as Melita Mew, his secretary and close friend, served tea and scones with cream. Two other intellectual giants who gave me much encouragement and criticism were the late Donald T. Campbell (former president of the American Psychological Association) and Paul Levinson (chair of the Media and Communications Department, Fordham University).

This book was not directly supported by any awards, but it has benefited from other work I did which was sponsored by the Institute for Humane Studies at George Mason University and the Open Society Institute, New York. I thank them for their moral encouragement as well as financial help.

I also would like to thank my father Frank Percival and my brother Paul for their moral support. It was my father who gave me the precept that you should get a day's work done by noon, then you'd have the rest of the day for yourself.

Prologue: People Are Rational

My Outrageous Idea

The myth of the closed mind is the popular theory that some people, or some beliefs, are impervious to argument. Almost everyone today seems to accept the myth of the closed mind. But I want to provoke you, by getting you to consider the possibility that there's no such thing as a closed mind—or if there is, it's very rare, and cannot prevent ideas from being changed under the impact of criticism.

If I'm right, then the most menacing ideological juggernauts, such as Communism, National Socialism, or Islamic Fundamentalism, are vulnerable to criticism and can be brought down by argument—though I don't deny that they can inflict a lot of damage before they are toppled. And this applies to any future system of beliefs that may arise. It also applies to minor sects, such as Scientology, the Unification Church (Moonies), or Jehovah's Witnesses. And it applies to minority views which educated people tend to view as terribly wrong-headed, such as biblical creationism, '9/11 truth', or Holocaust revisionism.

My view—admittedly outlandish and extremely unpopular—is that people just can't help being rational. In saying that people are rational, I'm not saying that people don't make mistakes. We all make mistakes—that's an essential part of being rational (a totally non-rational entity could never make a mistake). Nor do I mean that everyone has the same opinions as you or I, or can easily be brought round to our obviously correct opinions. To the contrary, I maintain that human beings are always fallible, unfathomably ignorant, and highly prone to error. Even worse, some of them have the nerve to hold opinions contrary to yours and mine, and to cling to these opinions quite stubbornly. When I say that people can't help being rational, I mean that they can't help correcting their errors once they become aware of them. And, a lot of the time, they can't help becoming aware of them.

I'm not belittling the role of error or ignorance. I share Newton's perspective when he said:

> I do not know what I may appear to the world; but to myself I seem to have been only like a boy playing on the seashore, and diverting myself in now and then finding a smoother pebble or a prettier shell than ordinary, whilst the great ocean of truth lay all undiscovered before me. (Brewster 1855)

Newton was not suggesting that we could not sail out into the ocean of our ignorance or make corrections as we explore the world. He only meant to suggest an appropriate awestruck humility at the degree of our ignorance and the possibility for piecemeal progress. However, piecemeal progress in correcting error is all I need for my argument. As Darwin discovered, given sufficient time, repeated minute incremental change can bring about radical change in the end. I'll show you later that with ideas you sometimes get an unforeseeable catastrophic change instigated by a small change.

Our evolution has made us sensitive to the way the world is, given us a degree of general curiosity about the world, a respect for logic, and a respect for effective and efficient means. Our five senses are continually checking the world and our actions and revising our beliefs in a process that we cannot voluntarily suspend except by sleep, drugs, or suicide. We can decide to investigate some issue more or less thoroughly, but we cannot decide what we believe or decide to suspend the impact of sensory or intellectual revision to those beliefs. Philosophers have often portrayed our rational beliefs as those deriving from voluntary deliberation. It's assumed that our power to decide what we believe is essential to their being rational. However, though we are free to conceive what we will, we cannot choose what we believe. As David Hume pointed out:

> We can, in our conception, join the head of a man to the body of a horse; but it is not in our power to believe that such an animal has ever really existed. (1978, p. 39)

It's the fact that our beliefs are out of our immediate voluntary control that makes them rational—the exact opposite of what many have thought. Try an experiment on yourself, now. Take a belief that you have, say, 'The moon is made of rock' and change it to: 'The moon is made of cheese'. Your goal is to make yourself sincerely believe that the moon is made of cheese. Let me know when you've achieved this.

We can decide not to read or listen to an argument, but we can't decide to remain untouched by a telling argument that we have heard or

read. We cannot decide to be unmoved by the validity of an argument that we grasp. As Plato put it, we cannot knowingly accept error (if we think it's error, then we are not accepting it).

Darwinian evolution has given us rough and ready but robust and irrepressible, specialized brain modules for solving special recurrent problems our ancestors faced during the Pleistocene: choosing a mate, detecting cheats, making inferences about the world of people, animals, and objects. However, we've also inherited the means for correcting the sometimes biased and distorted results of these problem-solving modules. We have inherited language, which enables us to frame and test ideas in sophisticated ways that make use of but go beyond the useful but limited brain modules. Indeed, most of the deductive arguments we use in language we execute outside our heads on paper or in a computer, and so they cannot be part of these modules. We have also inherited a general curiosity that goes beyond the questions our automatic modules are adapted to solve.

I'm not suggesting that evolution must give rise to rational humans. Contrary to the naive presumptions of *Star Trek*, in which most aliens are humanoid, differing only in brow-bone shape and skin colour, evolution is a contingent process, not a ladder of progress inevitably culminating in human-like people. If you ran evolution again, you would might not get anything like *Homo sapiens*. Nevertheless, I'm arguing that since it did give rise to us, we ought to expect our minds to have the characteristics that a Darwinian evolutionary process would give rise to, once it happened to take the turn of producing something like us. The logic of my argument is like this. Suppose you found a car you'd never seen before and you were trying to establish how it works. Knowing who designed it and by what methods it was constructed would help you understand how it works. It wouldn't determine how it works; just help you to understand how. The same goes for evolution and how the mind might function.

Economists and evolutionary theorists are increasingly adopting the idea that all organisms are rational to some degree. Even an ant or a slug, strange as it may seem, exhibit the rational allocation of scarce resources to achieve their ends. People have other ways of rationally dealing with the world, but they also share rudimentary economic behavior with slugs. Evolutionary theorist Jack Cohen suggests that some evolved functions are contingent and others are universal. Walking on two legs, for example, is contingent, whereas the eye has evolved independently many times. Perhaps some components of rationality are universal. Therefore, even though you would probably not get humans again if you re-ran evolution, you might very well get rational organisms.

The Main Arguments for the Closed Mind

I'm now going to run quickly through the stock arguments for the Closed Mind—the idea that some people and ideas are impervious to argument. In the rest of the book I'll consider some of these arguments much more thoroughly.

Argument #1. Emotion

Some people adopt ideas because of their emotions. Emotions are independent of reason. Therefore, emotions are unaffected by our theories or assumptions about the world. However, a critical argument has to have a theoretical target in the sense of an assumption or a theory. Therefore, emotions and the ideas they maintain are impervious to argument.

Rebuttal

I hold that the Stoics were essentially right about the relation between ideas and emotions. Emotions are not in conflict with our intellect, but serve it strategically and are triggered and controlled by our theories about the world. We have the emotions we have because they have helped to solve recurrent problems our ancestors faced and are highly sensitive to information about our situation.

A husband comes home one evening and outside the door sees a man running menacingly toward his wife with an ax above his head. The husband is angry with the ax man and runs over to attack him. However, as he gets nearer, the man notices that the man with the ax is actually defending his wife from a rabid dog. His anger toward the man instantly evaporates. This switching of the direction of emotion once the facts are interpreted differently is entirely normal and typical (though often less instantaneous and dramatic than in this example).

Argument #2. Wishful Thinking

A more specific argument from the alleged irrationality of emotion is the idea that people adopt beliefs because of wishful thinking. They hold a belief, not because of evidence or inference, but because they wish it to be true. Therefore, beliefs based on wishful thinking are impervious to argument. The related (but opposite) phenomenon is fearful thinking—believing something because one fears it to be true.

Rebuttal

First, let me point out the obvious: people don't believe everything they wish were true. Everyone believes in thousands of factual states of

affairs they would prefer to be different. For instance, I believe that I will die at some point in the next fifty years, that I am not going to receive a gift of twenty million dollars next week, and that no matter how hard I try, I cannot levitate. So it can't be right that people simply believe whatever they wish were true. (Similarly, it can't be right that people simply believe whatever they wish were not true.)

Presumably what's meant then is that in some doubtful or difficult cases, people have a bias towards believing that what they would prefer to be true is true. But if that's what's meant, I think we can defend wishful thinking as a useful heuristic. We live in a world of which we are mostly ignorant and in which our hypotheses are frequently refuted. This is true even of our so-called 'direct' observation. It's possible to be too sensitive to apparent counter-evidence and the best approach is to stick to our guns to see if they're loaded. It would not serve our long-term objective of getting at the truth if we were *too* ready to drop our hypotheses at the first apparent refutation. Therefore, when we seem to have counter-evidence against a hypothesis about an important issue, wishful thinking is one way of maintaining a belief so that it may be re-checked against evidence. If the stakes are high enough, it's worth re-checking the evidence.

Often, when it's claimed that people believe things because of wishful thinking, or because they 'want to believe' them, this doesn't mean that they simply believe whatever they would prefer to be true, but that they believe what fits in with their overall theory. For example, Mormons have a bias towards believing that influences from the ancient Middle East can be detected among Native American cultures, and some Mormon scholars claim to have found such influences (such as affinities with Hebrew among ancient Mexican languages). This is because these scholars recognize that, if there are no such influences, *The Book of Mormon* must be a work of fiction, not history, and the Mormon religion must be spurious.

We may say, if we like, that the Mormon 'wants to believe' that such influences will be discovered, but this is not because the fact of such influences, if it were a fact, would be inherently delightful, but because it would appear to confirm the total system of ideas, the Latter-Day Saints religion, to which the Mormon is attached. When a Mormon scholar adopts this approach, he is doing something rational: applying his currently favored theory to new areas, hoping he will find a fit. The tacit recognition that traditional Mormonism would have to be abandoned if no such cultural traces could be found is clearly a recognition that Mormon beliefs must comply with such truth-sensitive values as consistency and empirical testing. (And, of course, many former Mormons have abandoned Mormonism for precisely this kind of reason.)

Argument #3. Linguistic or Conceptual Frameworks

In the novel *Nineteen Eighty-Four*, George Orwell describes a language, Newspeak, that the state imposes on the citizens with the idea of shutting out all possible criticism (Orwell 1977). A number of subsequent writers have made Orwell's fantasy seem plausible to many. For example, Thomas Kuhn's notion of a paradigm may have contributed to the plausibility of Orwell's nightmare. Kuhn argued that each generation of scientists operates with an incommensurable set of problem solving conceptual tools and the different successive generations cannot therefore really understand one another. Benjamin Lee Whorf also made it popular to identify thought and language and to suppose that the thought of every individual is trapped inside the language of their social group (the Sapir-Whorf hypothesis). The suggestion behind Newspeak is that once learned, the sanctioned language prevents people from thinking outside the language, and it therefore is impervious to outside criticism. People then pass on the sanctioned language, unaltered and secure, down the generations.

Rebuttal

Ideologies, linguistic and conceptual frameworks that someone might suppose could monopolize our minds and shield us from outside criticism, need to be learned. However, learning involves innovation and a trial and error process that prevents any kind of Newspeak from taking over our minds. There will always be "Winstons" who fail to learn the sanctioned language and often introduce, by design or accident, innovations into this language. Someone might say that some agency could police any inadvertent deviations from the sanctioned language, nipping any incipient criticism in the bud. However, any attempt to control this only takes the learning process up to a higher level, and who then can police the thinking of the thought police?

The Sapir-Whorf hypothesis has been shown to be false: the fundamental categories applied to such matters as animal species, time, and color are basically the same in all languages and cultures. The language we use does not determine our conception of reality.

Argument # 4. Immunizing Stratagems

Some people, on encountering strong criticism, introduce what they regard as insignificant alterations in an idea to deflect criticism from it, thereby protecting it. This is the 'immunizing stratagem', analyzed by Karl Popper. For example, faced by the fact that communism did not

emerge in the most industrially advanced societies first, a Marxist might resort to 'countervailing factors' to 'save' the theory from this refutation.

Rebuttal

Far from saving a theory, immunizing stratagems either empty a theory of content or encumber it with defensive baggage. In either case, the 'immunizing stratagem' changes the theory and usually impairs its ability to spread. Such ploys save the adherent from what he wrongly sees as the embarrassment of admitting error, but in doing so they transform the theory, so that it does not mean what it meant earlier.

Argument # 5. Protective Shell and Essential Core

A more sophisticated method of avoiding critical argument is to make a division between the 'core' of a system of ideas, which is maintained in the face of all criticism and a dispensable 'protective shell' that takes all the critical deformations and concessions.

Rebuttal

This defensive ploy runs into fundamental logical problems. The protectors of the system cannot fully survey the unfathomable impact of revisions to the protective shell; they therefore cannot guarantee that by modifying the nose, they will not damage the face. A look at the logical aspects of this situation indicates that these problems for the propagandist are insuperable.

Argument #6. Blind Faith

Some people adopt and maintain an idea because of faith. Faith is a blind, incorrigible belief in a system, denying the relevance of reason. We've all heard someone say, 'You will not convince me, for my belief is based on faith'. Faith and the ideas it supports are therefore impervious to argument.

To quote Sam Harris, a prominent critic of religious belief:

> The idea, therefore, that religious faith is somehow a sacred human convention—distinguished, as it is, both by the extravagance of its claims and by the paucity of its evidence—is really too great a monstrosity to be appreciated in all its glory. Religious faith represents so uncompromising a misuse of the power of our minds that it forms a kind of perverse, cultural singularity—a vanishing point beyond which rational discourse proves impossible. (Harris 2006, p. 25)

Rebuttal

Perhaps faith is mere bluff. Perhaps there is no such thing as faith, but as a defensive ploy, it works on opponents of such creeds that use it. It works not by securing the belief in a system from critical argument, but by discouraging critical argument from opponents. The widespread use of the faith ploy suggests to me that those who claim to have faith and to be beyond reason are actually tacitly aware of the tremendous force of argument.

Belief and faith are quite different. Faith is both a voluntary defensive ploy and a voluntary expression of loyalty to a creed or group. Belief, however, lies beyond our direct voluntary control and is independent of loyalty. I presume you believe the moon is made of rock, not cheese. You cannot decide to believe otherwise, even if you wanted to do so out of loyalty to someone or even if I threatened you by putting a gun to your head and could monitor your beliefs with brain implants. In *Nineteen Eighty-Four*, Winston Smith is persuaded under torture to declare that he saw five fingers even though he saw only four. I'm saying that if someone believes they only saw four fingers, then a declaration—which is voluntary—that they saw five is all that torture can force out of that person, not a change of belief.

Argument # 7. People Are Illogical when Testing Their Beliefs

If people are open to critical argument, then they must be like scientists, putting their theories to a test. People must first work out what their theory logically implies and then search for counterexamples that falsify one of these implications. However, so the argument goes, the work of the psychologist Peter Wason has shown that people do not act like scientists (Wason 1966).

Wason told his experimental subjects that a set of cards had numbers on one side and letters on the other. He then showed his subjects four cards taken from the set and asked them to test the following rule: 'If a card has a D on one side, it has a 3 on the other.' Wason then asked them to say which of the cards they would have to flip over to test the rule. The cards were D, F, 3, and 7. The correct answer is D and 7. Only between five and ten percent of subjects gave the right answer. Hence, people are hopeless at falsifying their beliefs and even have a bias towards verifying what they already believe. Therefore, people already wrapped up in an ideology are impervious to critical argument—they just cannot do the logic. The ideology is hence perpetuated, secure and even increasingly verified, down the generations.

Rebuttal

Most commentators emphasize the ninety to ninety-five percent wrong choices and neglect the five to ten percent right choices. However, those percentages mean that in a population of one hundred thousand (not a big city but a modest-sized town) between five thousand and ten thousand people will get the right answer. That's a large number of people who are like scientists, checking their opinions by logical reasoning. However, one only needs a small number of dissidents to make a big difference.

In addition, any population has a small number of opinion leaders, intellectuals who have a disproportionate influence on the opinions of others. Is this the same set as those who get the logic puzzle right? Is there at least a large overlap? It's implausible that all the logical thinkers are deceptive or bribed leaders of the many allegedly 'irrational' cults and ideologies.

Leda Cosmides later discovered that if we change the puzzle from a purely abstract one to a puzzle involving the testing of some social rule about cheating, then many people become better logical thinkers (see Barkow, Cosmides, and Tooby 1995). Cosmides conjectured that we have inherited a reasoning module specifically attuned for detecting cheating. Commentators have emphasized the typical biases in these modules. However, Cosmides's conjecture would imply that if adherents of an ideology aren't getting anything in return for adherence, then any adherent is potentially capable of discovering the deception, and they'll drop the ideology. However, it's also clear that people, having inherited language, can become aware of their errors and biases, and learn the more abstract rule of inference. My experience is that when you explain the logic of the puzzle to people, they always get the point fairly quickly.

There's another way of looking at this that puts a kinder light on our rationality. For some time, economists, whose theories were mostly developed to analyze market situations, have been successfully extending these theories to apply to contexts where no explicit market trading is involved. One fruitful idea is that the search for information involves opportunity cost: when you're making a judgment, you collect relevant information. But when do you stop? As you collect information, the value of the other things that you could be doing that are necessarily forsaken by this information-gathering increases.

One day I was scanning some pages from a book using text recognition. I had done eleven pages and was disappointed to find that the scanner produced alternating pages of text and nonsense. So I looked at the

procedure I was using. I was scanning some pages in one direction, alternating pages in the other direction. I toyed with the hypothesis that the scanner can only recognize text in one direction. I devised a test: scan a page first one way then the other. The first direction I tried worked. I was tempted to take my hypothesis as confirmed and not bother with any further tests. But I remembered Wason, and so dutifully tested the other direction: gobbledygook. Would it have been irrational of me to just get on with my work? I don't think so. An alternative view is that perhaps it makes sense to make higher level conjectures about our hypotheses—guesses about guesses, such as guessing that I had done the right testing and enough testing of my scanner hypothesis and carry on with other urgent and important projects of the day. After all, continuing to test a hypothesis raises the opportunity cost, minute by minute. If the scanner had started making gobbledygook, I'd have made further guesses and done further tests.

My point is that the fact that people can improve their logic and take account of the cost of judgment hardly makes them closed to argument.

Argument 8. Mind-Viruses

Richard Dawkins argues that certain kinds of ideas are like computer viruses, taking control of people's brains to make more copies of them. Dawkins called these self-reproducing ideas memes or mind viruses (Dawkins 1990). Like computer viruses the memes that survive will be, not those that are truth-like, logically coherent and consistent with well-established knowledge, but rather those that are simply good at making copies of themselves. For example, Dawkins asserts that people adopt the religion of their parents, not after a careful rational comparison of alternative religions, but simply because the memes for that religion are what they are exposed too. Therefore, it seems, people infected by these mind viruses are impervious to argument.

Rebuttal

I completely accept that Dawkins's basic notion of memes is illuminating and captures something true. However, ideas and theories are not passed on by a process of copying in the same way someone might copy the wearing of a baseball cap backwards or the wearing of the latest stylish suit. When parents tell their children a theory about the world, the child does not simply copy this statement, word for word. If the child has understood the theory at all, then the child can extract the sense of the theory and restate it in different words than the those the parents used.

Put differently, there are some ideas we cannot adopt without understanding them—not necessarily a complete or deep understanding, but an understanding of what the idea means. The idea has to be graspable or intelligible.

The child assimilates the new ideas into his network of assumptions about the world. Children already appreciate rudimentary logic and spontaneously work out new implications from the augmented set of assumptions. However, this means that the child will say things that his parents did not, and would not, say. I remember my aunt telling me one day that God is everywhere. Later that day I was walking with her and we passed by a gap in a row of trees. Through the gap, I saw a wide-open field, apparently completely empty. I asked my aunt whether God was there in that field. (Presumably, my question was prompted by the tacit logic: God is everywhere; the field is somewhere; therefore, God must be in the field, even though it looks empty.)

Dawkins assumes that if an idea is adopted for no reason, then reason can't evaluate or reject it. This is a serious and common misunderstanding. I might adopt a choice as to which road to take by tossing a coin, but then later reject my choice because of new evidence that refutes my assumption that the road is leading me to my preferred destination.

Argument # 9. Dumb Decision Rules

There's a seemingly endless torrent of popular books explaining how thoroughly dumb and decidedly crazy we all are. To mention just a few examples (and I give the subtitles here as well as the main titles, as they help to convey the flavor of these books): *Kluge: The Haphazard Construction of the Human Mind* (Marcus 2008); *Predictably Irrational: The Hidden Forces that Shape Our Decisions* (Ariely 2009); *Risk: The Science and Politics of Fear* (Gardner 2009); *On Being Certain: Believing You Are Right Even when You're Not* (Burton 2008); *The Hidden Brain: How Our Unconscious Minds Elect Presidents, Control Markets, Wage Wars, and Save Our Lives* (Vedantam 2010); *Sway: The Irresistible Pull of Irrational Behavior* (Brafman and Brafman 2008). All of these books have sold at least fairly well, and some of them are huge best sellers that have been through several editions.

These works are all entertaining and contain many fascinating anecdotes and insights; here I'm only concerned with the message they preach that people are generally irrational.

Here's how the typical argument goes. People's beliefs are not produced by a careful evaluation of the evidence. People are instead led to

their beliefs by unjustified systematic biases. Much research has shown how bad we are at forming well-considered beliefs. We use a number of stupid heuristic rules for making decisions. One rule is called anchoring (focusing on an easily accessible value and then making our judgment by adjusting to that). Another is called the ease of recall rule (when estimating the likelihood of some type of event, we will use the rule: 'If you can remember similar events easily, then it's likely'). An example would be our over-estimation of the likelihood of dying in a plane crash because it is much easier to remember plane crashes than car crashes—the latter aren't newsworthy unless they involve the death of a famous person. Another example of the 'easier to remember' rule is that people will estimate the likelihood of a commercial nuclear disaster much higher than a disaster in similar energy-intensive industry such as gas, than is warranted by the statistics, simply because they can easily remember events like Chernobyl and Three Mile Island.

We are incorrigibly locked into these biased modes of thought, and so any ideology that could exploit these biases would be safe from criticism.

Rebuttal

There are a number of points to be made about these supposedly dumb decision rules.

1. In situations requiring rapid decision, they are a way of economizing on valuable time. We need something to work with; some idea is better than none.

2. In the search for the best decision, it does not matter how we arrive at our judgment, provided that we actively seek to check the judgment. I can decide what stock to invest in by consulting tea-leaves, and then use reason to correct the suggestions later by carefully observing the evidence. This is a fundamental methodological point. It's assumed by all this human-bias literature without so much as an argument, that we cannot operate rationally with guesses, that is, judgments formed independently of the evidence. But according to the scientific methodology of falsificationism, championed by Karl Popper, we can and must use guesswork as a source of hypotheses to test, in the quest to get nearer to the truth.

3. The tirade of books that gleefully announce Joe Public's irrational biases overlook the full import of the fact that we *have* discovered them and so we can be made aware of them. This knowledge can

> even show us how to redesign institutions to minimize the incidence of costly biases. There are, after all, millions of people who have read at least one of these books, who presumably congratulate themselves that *they*, at least, don't commit these stupid blunders in reasoning.

Fine though this literature is at displaying the sometimes-surprising biases and typical errors that afflict us, it fails to affect my point that people are open to argument. It could only do so by showing that we fall irretrievably into these biases and characteristic errors: it does no such thing. Since we can learn about these typical errors and even give them names, we can escape and even prevent them and so all such errors are open to argument.

Ghostly Logic

We need both abstract logic and our material brain modules to explain the emergence, persistence and death of ideas. How can an abstract thing like logic and a material thing like our brains have a bearing on the same problem? Let me illustrate this with the belief in ghosts. We create beliefs in supernatural agents like ghosts because we are supersensitive to signs of agency; we then cannot easily get rid of these beliefs, even if they are errors, because they are logically irrefutable.

I grant that some ideas do have a degree of stubbornness against criticism. Anthropologists have found that all societies have some belief in ghosts and other supernatural agents. There are two factors working together to cause this relative stubbornness and universality. One is the way our brains are biased by evolution to produce guesses of certain kinds about our world; the other factor is to do with the logic of those guesses. We readily guess the presence of agency, but some of these guesses are irrefutable by direct observation. We form these beliefs because we are supersensitive to any signs of agency in the world. A freak gust of wind on an otherwise still day slams a door behind us and we think there is someone there; we hear voices in the wind or running water and think there is someone there. But though they are relatively stubborn, we can learn to criticize these ideas with the more circumspect methods of internal consistency and consistency with the rest of our knowledge. Our genetically inbuilt module for language helps us to do this, thus compensating for the more reflex and rough-and-ready operation of our modules for detecting agents.

In a world of uncertainty, organisms need to make guesses, to explore and check that world. But we cannot test out every guess. Our ancestors became biased to guess the presence of agency because things with agency—people and animals—were the most important and urgent things in their world (tigers out to eat us, people who may be friend or foe). Rocks, trees, and gusts of wind are not good as friends and rarely pose a threat or short-term opportunity, but people and animals do. Failing to detect a friend or foe can be costly; on the other hand, falsely detecting friend or foe, when not dealing with a consciously motivated person, has little cost—hence the bias.

We may look about for the agent and find none. Is it not rational to abandon the fancy there and then? Not necessarily, because the possible presence of friend or foe has great urgency and importance, so it is a possibility worth extra effort to re-check. However, the thought, 'There is some agent acting to cause the door to slam or the wind to make sounds like voices' is not amenable to refutation. Try as we might to find evidence against it, we can always say 'but we haven't looked in the right place'. And if we chance upon the idea that it is an invisible or remote agent, then that explains our inability to find it. But once we have the idea, we are then saddled with it, because it is logically irrefutable.

We lie awake at night without hope of removing the possibly wrong idea because there is no observation that would put our mind at rest: we look in the kitchen, in the cupboard, and so forth, but we cannot definitively show that it is not there. On the contrary, there are still the odd phenomena that seem to indicate agency and these constantly remind us of our fearful fancy. So, these ideas are irrefutable by direct observation, but nevertheless verifiable in a weak sense. How can we ever divest ourselves of these ideas? In the cold light of dawn the specters are easily removed because we are reminded of reality and can draw on our knowledge of scientific theories that imply that ghosts are nonexistent. At least until the next freak gust of wind on an otherwise calm day!

The Orthodoxy

The attempt to evade criticism is familiar to us all. 'It's like talking to a brick wall', 'You can't reason with him; nothing will change his mind', and 'We'll have to agree to disagree' are all commonplace remarks that allude to this common experience and to the assumption that some people are closed to criticism. These phrases suggest, not merely a degree of stubbornness, but a relentless imperviousness to argument. Some

people, we are told, have a disposition to believe things whatever the evidence to the contrary.

Many eminent thinkers hold this position. For example, Dawkins, the brilliant Oxford evolutionary zoologist, asserts that some theories can exploit what he calls "blind Faith," so that absurdity not only enhances an idea's ability to spread through the population like a virus, but also makes it secure against counter-evidence: "Another member of the religious meme complex is called faith. It means blind trust in the absence of evidence, even in the teeth of evidence" (1990, p. 198). Despite this gloomy view, Dawkins is one of the most eloquent and ingenious practitioners of rational argument.

Dawkins is not alone in the attribution of absolute stubbornness to certain doctrines. Consider this frightening declaration from Sam Harris:

> Some propositions are so dangerous that it may even be ethical to kill people for believing them. This may seem like an extraordinary claim, but it merely enunciates an ordinary fact about the world in which we live. Certain beliefs place their adherents beyond the reach of every peaceful means of persuasion, while inspiring them to commit acts of extraordinary violence against others. (Harris 2006, p. 53)

Notice that although Harris defends his recommended policy of killing people for having the wrong beliefs by reference to the likely practical consequences of these beliefs, he thinks it is okay to kill them even if the practical consequences he surmises have not yet ensued. Individual religious fundamentalists may be killed even if those individuals have not yet done anything wrong or harmed anyone. We see here (in a particularly grisly instance) how the notion that people who hold different opinions to ourselves have closed minds tends to encourage the abandonment of argument and the resort to violence. If it can be widely understood that, after all, people's minds are not as closed as Harris imagines and their belief systems are vulnerable to rational criticism, then one policy conclusion would be: More explanation, less extermination.

The revered Polish thinker Leszek Kolakowski wrote:

> Not only in the 'socialist bloc', where the authorities used every means to prevent information from seeping in from the outside world, but also in the democratic countries, the Communist parties had created a mentality that was completely immune to all facts and arguments 'from outside,' i.e., from 'bourgeois' sources. (Kolakowski and Falla 1978, p. 452)

In a similar vein, consider the words of the scholar of ideologies, D.J. Manning: "An ideology cannot be challenged by either facts or rival theories" (Manning 1976, p. 142).

I reject these pessimistic pronouncements on the power of argument. I aim to show you that there is far more openness to argument in even the most stubborn people and systems of ideas. Contrary to Dawkins and many other thinkers, I argue that the more absurd a doctrine, and the more it hides from criticism, the less its ability to spread. Investigating this issue will take us on a journey through varied terrain: psychology, sociology, logic, and the philosophy of science.

The Turnover of Adherents

I'm not asking you to deny your own experience. We do meet people who seem impervious to our well-thought-out and carefully marshalled arguments. But there's also the common experience reflected in the expression 'It takes time for the penny to drop'. Often, people change their ideas, or openly admit to changing their ideas, only some time after they have encountered a challenge to these ideas. We may have had the opportunity years later to meet some of these seemingly impervious people and discovered that they have in fact modified or completely changed their minds or that what once seemed vitally important to them now seems less so or even irrelevant. When people are overwhelmed with emotional shock, they seem oblivious to the facts because of the intense emotion, but this may again be an example of the fact that it takes time to absorb the import of the event. As Shakespeare put it: "Thou know'st we work by wit and not by witchcraft, and wit depends on dilatory time" (*Othello* II:iii, lines 376–79).

We also observe that formal organizations devoted to promoting an ideology have a turnover of membership and are subject to splits and other dramatic internal disagreements. When we look at the western Communist Parties in the 1930s, we're at first impressed by what looks like formidable discipline, strength, and staying power. But all the time, some CP members are leaving and new people are joining. Typically, in all such ideological bodies of adherents, there are a few stalwarts who remain at the helm through thick and thin, while the great body of members are continually being replaced. A similar phenomenon affects religious movements. Eileen Barker found that at least sixty-one percent of those who joined the Unification Church during a four-month period in 1978 had left within two and a half years (Barker 1988, p. 167). Others have found very similar defection rates in various minor religious sects.[1]

[1]
The Persuader's Predicament

When someone asserts that people are vulnerable to irrational ideas and may become impervious to outside argument, what they often imagine is a charismatic leader dominating the attention of potential followers and simply infecting them with his ideas. Hitler's rallies come to mind in which the popular view is that Hitler played the minds of the crowd like a puppeteer. However, the situation is more complex.

When a cult leader, religious thinker, or political ideologue hatches a new idea with which to charm his followers, the idea is like a new kind of fish in an ocean of other well-established fish all competing for resources and opportunities for reproduction. The ideologue wants his idea to be copied from mind to mind and from generation to generation, but other ideas have a head start and are also trying (so to speak) to get themselves adopted and spread by people. People have only so much attention and memory capacity to devote to these ideas. Because of these constraints, people have to choose between rival ideas and the propagandist is forced to take account of the preferences of his audience and the character of his competition.

We should distinguish between politicians or others, who manipulate existing ideas without changing them very much, and long-term propagandists, who are successful in changing the commonly accepted ideas within a large population. Adolf Hitler did not so much play the crowd like puppets, but had to tailor his message to suit the dominant ideas of the time. Hitler was an adroit politician and an accomplished public speaker, but he was more a puppet of ideology than its puppet-master. Hitler was not a creator of a completely new system, but a skilled user of ideas hatched by intellectuals writing decades before him. For example, ideas favoring racial hygiene and compulsory sterilization of the unfit reached their peak of popularity and political influence in western countries, including Britain and America as well as Germany, in the 1920s.[7]

Certainly there are other factors at work, factors not directly related to argument, in the success or failure of systems of belief. Some beliefs, like those espoused by Hitler's movement, have harnessed compulsion, torture, and mass murder to suppress their rivals. There is also simple lip-service paid to a dominant ideology, independent of genuine conviction. But I would like to see how far we might go focusing on the audience's preference for truth and information. Whereas particular regimes and particular thugs may come and go, logic and truth have an eternal quality which, like a barely noticeable evolutionary advantage in biology, can have a major long-term influence.

Trading Off Closedness for Spreadability.

Let's look more closely at the logic of the propagandist's situation. Suppose his two goals are 1. to guarantee the propagation of his doctrine and 2. to guarantee it against being damaged by criticism. Guaranteeing the idea against criticism is often thought to be a way of promoting its spread. However, neither goal can be perfectly fulfilled, and they must be traded off for one another. Maximizing the ease with which an idea can be copied requires making it more open to criticism; maximizing the idea's closedness to argument makes it harder to copy from mind to mind.

Any system of ideas is likely to contain a mixture of some truth and some falsity; some good arguments and some bad arguments. The truth content of an ideology and the validity of its arguments enhance its ability to propagate and its falsity content and the invalidity of its arguments diminish its chances of being propagated. Why should this be? Part of my answer is that people have an innate curiosity about the world and so prefer true and informative ideas. As a consequence, in competing with other propagandists, the successful ideas tend to be shaped to satisfy our curiosity. But an idea that says more about the world is proportionately more open to counterexamples. For example, consider the sentences:

A. All cyclists live longer than non-cyclists.

B. All non-smoking cyclists live longer than non-cyclists.

Other things being equal, we would prefer to adopt sentence A because, being more general, it tells us more about the world. We would know something about all cyclists, rather than some qualified subsection of them. However, A is open to more kinds of counterexamples than B just because A is more general. A is refuted by any cyclist (whether smoker

or not) who has a shorter life than a non-cyclist. On the other hand, B is only refuted by a non-smoking cyclist who has a shorter life than a non-cyclist. We see here that making ideas more attractive for adoption (in this case, by making them more general) may have the unintended consequence of making them more open to potential criticism.

Consider the interest in UFOs. Suppose the following sentence were true: 'At 10:00 A.M. every morning at coordinates XY you can see an oblate spherical spacecraft of 100 meters diameter made of metal, impenetrable by diamond cutting equipment.' Unless immediately dismissed as obviously false, this assertion would quickly spread throughout the world's media. Compare this with the following sentence: 'Someone saw one morning at 10:00 A.M. at XY coordinates an oblate spherical spacecraft of 100 meters diameter made of metal, impenetrable by diamond cutting equipment.' Other things being equal, this would have a short lived existence in the media of the local town nearest to XY coordinates. Why? Well, because, being more general, the first sentence would be more checkable—reporters would turn up at the right time and place and find that there was indeed such a craft with the claimed properties. The excitement at discovering such a craft would spread like wildfire. Of course, someone might say, that's why real 'reports' tend to be worded in such a way as to avoid repeatable checks by independent witnesses, and it is because these 'reports' are cunningly crafted to be impervious to argument that they survive. Nevertheless, I think it's clear that the true and informative UFO story, if it were taken at all seriously, would get more press and prevail over its vaguer cousin.

Narrow Curiosity or General Wonder?

But do people have a general curiosity about the world, or do they only care to think about very specific types of question related to their narrow practical interests? If people have a free-floating, general curiosity, then the propagandist can't tell in advance where his system might be scrutinized for coherence and truth. But if people only had narrow curiosities, then a propagandist might be able to fashion his ideology so as to avoid the checks of truth and coherence that these might impose. I maintain that people have a general curiosity about the world and their place in it and that religions and other systems of ideas have to accommodate themselves to this fact about people.

When teaching introductory philosophy I begin my course by asking my students to remember their childhood questions about the world. I do get some rather mundane, narrow minded questions, but I also get many questions that express a general, sometimes quite deep, curiosity in the

world: Why are clouds white? Why do stars shine? Do the stars move or are they stationary? Why do we live? Why do people die? Why is water transparent? Why can't we fly? Why don't planes fall down? Why can't we converse with animals? How can we walk in a straight line? Are there people on other planets? One of my students remembers asking her mother "Why do we have to eat?" She even remembers deciding to see what would happen if she did not eat! These seem to be questions that have spurred the greatest thinkers of science, philosophy, and religion.

For a long time, cognitive psychology assumed that the mind was very much like a general-purpose computer. It has general problem-solving strategies to solve all kinds of problems, whether these are to do with people, objects, animals, or tools. However, evolutionary psychology now argues that the mind is not a general-purpose computer, but more like a bundle of domain-specific problem solving machines. This is the modular hypothesis, first put forward by Jerry Fodor. Fodor actually left room for a general-purpose creative thinking and inferring machine, but other writers have tried to argue that all thought issues from a bundle of special purpose machines. I think there's a large amount of truth in the modular hypothesis but, like Fodor, I leave room for some general-purpose creativity and deduction.

In line with this modular approach, some have argued that we do have curiosity, but that it is channeled by our desire to explain very specific things and that these explanations satisfy particular modules of the mind. Pascal Boyer (2002) offers an account of religion in which he stresses the particularity of our curiosity. He thinks that it undermines the idea that we have a general curiosity about the world and the theory that religions are, at least in part, an answer to this. He criticizes what he calls intellectualism, which he expresses as: "If a phenomenon is common in human experience and people do not have the conceptual means to understand it, then they will try to find some speculative explanation." He then points out that there are many such phenomena, but that people do not in general try to explain them: when you lift a pint of beer to your lips by willing your arm to move, you are not moved to explain this, yet how can a non-physical thing like the mind affect a physical thing like a pint of beer? Boyer says this is only a problem for those that have been brought up in a long intellectual tradition.

One of my students did wonder as a child why we are able to walk in a straight line, a significant problem in neuropsychology. More generally, I think Boyer is overly impressed by the fact that people are not trying to explain everything all the time and that people have stopped at some point in their speculative explanations or curiosity. But the world

is a rich place for uncountable questions and it is multi-layered, like an infinite onion. Even science at any given point has only gotten so far in the process of explanation, as it peels off the onion layers to reveal the world's underlying structure. If you look at the childhood questions my students remember or at the ones your children ask, it is clear that many of these questions were the inspiration for great advances in science and philosophy. Should we dismiss them simply because the child does not advance much beyond them? It takes a Galileo or a Newton to do this. The fact that few people think about the mind-body problem is more a reflection of the depth to which one must go in explanation before this becomes a problem, not evidence of a lack of general curiosity. Boyer refutes the rather crude intellectualism that he mentions, but that still leaves room for a general, free-floating curiosity in the world.

And after all, if there's no wide wonder about very general matters, how can you account for the fact that you're reading this book?

Truth Is an Advantage in Propaganda

Truth and validity enhance an argument's persuasive strength. Truth acts as a Darwinian filter on ideas through criticism and it satisfies our innate curiosity, which prefers more rather than less truth in our ideas.

The propagandist who propagates a true message can also take advantage of the fact that the world reminds him and his audience of the message. Reality is a mnemonic. This effect will be greater the more truth the message contains, because it will then have a bearing on more of reality. Theories with the greatest truth content speak about the observable world, that part most likely to act as a mnemonic.

Intellectual history, particularly a comparison between science and religion, bear out my suggestions. Religion is often held to be the most stubborn of all ideologies. Freudianism and Marxism have often been described as religions, insinuating that they are closed to argument and rationality. If I can show that even religion can offer no immunity from criticism, then I will also have shown as a corollary that even if Marxism and Freudianism assume the form of a religion, they will not thereby be closed to criticism.

Religion, like science, has tried to provide an information-rich account of the world and religions which have been most indifferent to truth have tended to be eliminated. Religions attempt to satisfy our preference for coherence and truth and their history is shot through with the use of abstract argumentation and a deep concern for logic. They may not have been as successful as science in doing this, but it is hard to understand the development of religions if this is ignored.

The Struggle for Coherence in Abrahamic Religions

One of the best examples of the sustained attempt to maintain logical coherence in a religious system is the attempt by early Islamic scholars to incorporate the works of Aristotle into Islamic thought. If powerful religious leaders can ignore logic and truth, why would a succession of outstanding Arabic speaking philosophers over hundreds of years devote such mammoth efforts to square the Quran and Aristotle? Why didn't Muslim leaders just ignore Aristotle? Instead Al Kindi, Al Farabi, Avicenna, Al Ghazali, and Averroes saw the strength of Aristotle's system, which they wanted to adopt, but also saw logical problems with doing so: Aristotle's work appeared to contradict the Quran in some respects. Most of these writers went to enormous lengths to try to make them cohere. Some took the alternative path of holding on to the bulk of Aristotle, while attempting to use philosophical arguments to refute and excise just a part of Aristotle's doctrine (for example, Al Kindi and Al Ghazali). Either way, these Islamic thinkers felt forced to appeal to logic. On Pascal Boyer's view, this makes no sense.

The Arabic writer Al Ghazali is often held up as the exception to this. In his book, *The Incoherence of the Philosophers*, he attacks certain philosophical positions (Avicenna's presentation of Aristotle), arguing that theology is superior to philosophy because faith provides a better road to religious knowledge. Some have taken this as showing that some strands of Islamic thought took a very different path afterward, belittling the standing of philosophy and ushering in a subsequent contempt for logic and argument. But it's quite clear that Al Ghazali was doing philosophy. The other great Islamic philosophers had been trying to argue that in general philosophy is compatible with theology, it's just another way to the same truths. But we shouldn't take this subtle marketing ploy at face value. Theology just is philosophy in the sense of using abstract logical argument in the quest to understand the world in a deep way. Theology's attitude to open debate and specific methods of argument may differ from the attitude of the typical philosopher, but that doesn't detract from theology's immersion in a turbulent ocean of argument that it must take account of. Even denying the reality of argument would constitute a target for argument—however, none of the Islamic critics of Islamic philosophy went that far, perhaps because such a move would also deny themselves the essential tool of argument for their own purposes of intellectual defense and propagation of what they accepted. It would be like a 'Doomsday Bomb' defense that only works if it destroys

[2]
Survival of the Truest

Darwinian evolution has made us rational. We prefer effective and economic means, we prefer truth to falsity and have a general curiosity about the world, we prefer logical arguments and consistent theories, and we are disposed to check our hypotheses against the facts. Even our wishful and fearful thinking is a means of thoroughly testing hypotheses that are important and urgent to us. These dispositions are not always decisive and there are other factors at work in our preference and rejection of ideas. We are lazy, distracted, fallible, incredibly stupid, and vastly ignorant.

However, we are born with the tools to curb the excesses of ideological deception. Cognitive psychology has shown that children already have an intuitive grasp of the world. They have an intuitive physics, an intuitive natural history, an intuitive psychology and an understanding of tools. Children have the robust rudiments of an understanding of logic. They also have the capability of forming hypotheses (jumping to conclusions) and then being surprised if their hypotheses turn out to be wrong. For example, if a child sees a frog squashed in the road revealing its insides, the child will be surprised if the next frog is not the same inside. If a child sees a cow give birth to a live calf, the child will be surprised if told the next one will lay eggs. Children are born with a categorizing disposition that places animals into natural exclusive classes, all the members of which are assumed to have the same characteristics. This is their intuitive natural history.

If a child sees someone walk across the road or pull something out of a pocket or press a button or do anything, the child will automatically assume that the person is trying to achieve something—that they have a desire to get to a goal and have beliefs about how they can do that. This is children's intuitive psychology. This disposition is so strong that they will impute desires and beliefs to dots moving and 'bumping' into one another on a computer screen, providing only that the dots move in the

right way. No one has to teach the child to perceive the dots as 'chasing one another', 'attacking one another', or 'helping one another', depending on the pattern of movement.

Any propagandist wishing to disseminate his message faces a multitude of innate critics—perhaps not sophisticated, but effective to a degree. We cannot easily be shaped in the image of any false, ineffective, uneconomic, or illogical ideology. A Hitler or a Mao has to take account somehow of the character of the material to be molded or chiseled: only certain things can be made out of quartz. The view that we are playthings of ideologies was plausible only before the blank slate view of human beings was shattered by the combined assault of cognitive psychology, economics, and evolutionary theory.

Evolution and Human Rationality

Darwin's fundamental intellectual puzzle was that the world is teeming with life forms that have the mark of being designed. A fish's fins are made to swim better, a hawk's eyes are made to see prey at great distance, and so forth. William Paley (1743–1805) in his *Natural Theology* had put the question memorably. If you were walking in the countryside and came across a smooth stone, you would think that its shape had been made by a river. However, if you came across a watch, even never having seen a watch before, after inspecting its intricate complexity, and noting how its parts are delicately dependent on one another, you would conclude that it had been made for a purpose. You would conclude there must be a watchmaker. What natural force could have brought together the parts in such an improbable arrangement? If there appears to be design, there must be a designer. If such reasoning is valid with a watch, then why not with every living thing? Indeed, why not go further? The world looks designed, therefore it is.

As a Cambridge undergraduate Darwin was deeply impressed and

selection is repeated millions of times, hardly noticeable increments of change could lead from a fish to a reptile and from a reptilian form to a mammalian form.

In Darwin's explanation there is no design or planning required for organisms to become increasingly more adapted to survival. The process of variation and the later process of selection between the variants are blind. This was a tremendous intellectual leap, because prior to Darwin, Lamarck's theory had held sway, in which life forms evolve by the action of use and acquired characteristics. Giraffes developed long necks because their ancestors benefited from stretching their necks to reach fruit higher on the trees and their longer necks were inherited by their descendants. More fundamentally, Darwin's theory also contradicted our intuitive natural history, which assumes that there are species with essences. A fish is a fish and cannot change into a reptile.

Sophisticated people can see how, say, the domestic dog evolved from quite different wild varieties of wolf, but need extra coaching to see that the wolf in turn could have evolved from something very different, the creodont, which lived at least sixty million years ago, ancestor also of cats, bears, weasels, raccoons, civets, and hyenas. This is a nice paradox, that Darwinian evolution, which gave us our intuition of species, refutes the simple intuitive idea of species. This may be the greatest, but not insurmountable, barrier to the acceptance of Darwin's theory. In any case, Darwinian evolution is change involving blind variation, selection, and reproduction.

Even Darwinism's major critics such as Stephen Jay Gould maintain Darwinism's key insight: that natural selection is the only way of explaining the emergence of complex and subtle adaptations. Gould simply disagrees with certain types of gradualism. Gould still relies on the idea of natural variation and natural selection.

Does the Modularity of Mind Undermine Rationality?

Does the fact that we evolved according to Darwinian evolution guarantee that we are rational? The old theory of evolution due to Lamarck did seem to guarantee this. Lamarck postulated a ladder of evolution, beginning with bacteria or other simple life form and step by step rising up the ladder, through fish, reptiles, mammals to finally arrive at human beings. Lamarckism implies that if you ran evolution over again, then you'd get human beings again, and that if you run it long enough with other creatures, then you'll also get humans as a the final step. If you

also believe that humans are rational, then for you Lamarck's vision guarantees rationality. In science, Darwin's theory supplanted Lamarckism. However, Lamarckism is still a popular assumption: many of the *Star Trek* episodes portray aliens as advanced humanoid with larger brains. The search for extraterrestrial intelligence is based on looking for radio signals, that is, on the idea that intelligent beings would likely be humanoid.

The popular imagination thinks of aliens as little green men. Jack Cohen, the reproductive biologist who specializes in plausible alien biology, once said: "I don't believe in little green men. Not so much because they are green, but because they are men." But Darwinian evolution is blind—it has no direction. It has no long-term goal. If you run it again, you may not get humans. We therefore have to be more careful in setting out an argument from evolution to human rationality. However, if there were non-humanoid green aliens, I would place a bet that they would be disposed to avoid failure or excessive cost. The ability to be effective in the world and not squander resources seems to be a minimum requirement for survival and reproduction. Whether the aliens had self-consciousness, general curiosity, language, an appreciation of complex logical relations, and the ability for long term planning would be less sure bets.

Evolution has adapted organisms to their past environment and mode of life, which may not be the same as their current or future environment and mode of life. We are adapted to the Pleistocene epoch. As Cosmides puts it:

> Our species spent ninety-nine percent of its evolutionary history as hunter-gatherers: the genus *Homo* emerged about two million years ago, and agriculture first appeared less than ten thousand years ago. Ten thousand years is not enough time for much evolutionary change to have occurred, given the long human generation time; thus our cognitive mechanisms should be adapted to the hunter-gatherer mode of life, and not to the twentieth-century industrialized world.

Cosmides calls the resulting rationality "ecological rationality." This is in contrast to Aristotle's conception of humans as 'rational animals'. The idea that humans have a general problem-solving mind dominated thinking in psychology and philosophy for thousands of years.

Cosmides's revolutionary approach has led many thinkers to conjecture that the human mind is not a general-purpose problem solver, but has many special-purpose problem solving machines built into it by the very specific demands of our ancestors' hunter-gatherer life. Our ances-

tors encountered certain problems for hundreds of thousands of years, and encountered other types of problems never. Our ancestors had to recognize objects, make tools, find mates, understand animals; they never had to solve or even understand the general and abstract problems of set theory or Goldbach's Conjecture, or wonder whether there might be life on other planets or why we can't fly like birds. Instead of being like a general-purpose computer our mind is more like a Swiss army knife.

This approach fits well with what psychologists have found. Our reasoning abilities are domain-specific and have their own biases and limitations. Jerry Fodor (1983) was the first to conjecture that the mind has a collection of special-purpose machines. Fodor said they are mandatory (you cannot stop them), fast-acting, domain-specific, encapsulated (they don't affect one another's operation), and break down independently of one another. For example, if you open your eyes, then you can't help but see a stable three-dimensional environment before you, this is instantaneous, what you see is not affected by what you hear and vice versa, and if you damage your brain in a car crash, then you can lose your sight without losing your hearing.

Fodor's original idea was that this was true of our senses and perceptual abilities. Fodor thought that there was a general-purpose thinking ability responsible for creative thought and deductive reasoning. But other writers have suggested that the general-purpose thinking itself can be divided up into a host of modules. Your mind is a herd of little Terminators that "simply will not stop."

Now, you may ask, does this undermine my whole approach? In talking about instrumental rationality (the preference for effective means), economic rationality, and logical rationality, am I saying that rationality is general, not specific? And if I admit that human rationality is fragmented into modules, each with its own biases and typical errors, then must I also concede that cleverly-constructed ideologies may survive the scrutiny of this weak "ecological rationality"?

Any such conclusion would be unwarranted. I maintain:

1. **The reasoning within each of these modules is not only effective but tough.**

and

2. **We can correct or compensate for 'errors' produced by the separate modules.**

[3]
Does Emotion Cloud Our Reason?

Can intense emotions associated with ideologies make the ideologists irrational and therefore insulated against all criticism? And would the ideology then be more likely to spread? Almost all writers take the irrationality of ideological emotion for granted, but I intend to show that the ideologies at issue are rational (though they may be mistaken or even foolish) and open to argument.

The implicit assumption of much talk about ideology is that ideological emotion is thoughtless and therefore independent of theory, and therefore critical argument is irrelevant for it has no target. I grant that intense emotion engendered by an ideology may impair the appreciation of critical argument, but I insist that argument is always relevant because our emotions are under the control of our theory of the world and our place in it. When people are overwhelmed with emotional shock, they seem oblivious to the facts because of the intense emotion, but this may again be an example of the fact that it takes time to absorb the import of the event. Shakespeare put it well:

> Thou know'st we work by wit and not by witchcraft, and wit depends on dilatory time. (*Othello*, II, iii, 376–79)

It's just because our emotions are imbued with theory that it takes time for critical facts or arguments to be appreciated. We can imagine that bad news can bring shock after shock, until it is all fully taken in. For example, it may be that a man's wife is leaving him when he has always loved her dearly, and he had thought that she valued him likewise. He discovers the facts, one by one and each may give him a fresh shock. She has another man. She had been having an affair for two years. The children also hate him, and they are also moving out with her. She has also emptied their joint account and given all the money to her boyfriend. His life savings were in it, and he has no other money. His yearly paycheck is

automatically paid into that account, and she waited to leave till he had just been paid a year in advance; an arrangement that his wife got him to negotiate with his boss just two weeks previously. Well, the first item may well take some time to adjust to, and that just may crowd out all the other aspects for a while. He may even stop reading at that point or he may read on but simply feel that first point so greatly that he misses the import of the later points. There is an element of distraction, but there is also the time required to work out the innumerable implications and ramifications of the shocking revelations. This is a logical and theoretical task.

Because our emotions have such a theoretical basis, they are subject to the rational filters I outlined in Chapter 2. It makes evolutionary sense that our emotions are under the control of our theory of the world and subject to the rational filters, for how else might they be made appropriate to subtle, complex, remote and even merely hypothetical circumstances? Inappropriate emotions lead organisms to shun the beneficial and embrace the harmful, and as a probable, though not necessary, consequence impair genetic reproduction. Of course, human beings are often foolish, but this does not mean that they cannot correct their errors; it only means that they are fallible and may take time to readjust their emotions to the facts.

Ideologies as Rationalizations of Irrational Emotions

There are two closely associated ideas about the role of emotion and morality in the emergence and spread of ideologies, both of which are thought to support the idea that ideologies are closed to criticism. The first is that ideologies spring from and thrive on irrational emotions, emotions that are not subject to reason, abstract theory, or argument: gut feelings of anger, resentment, envy, or greed, unadorned by ideas. In this theory emotion and thought are placed in radically different compartments. Pareto seems to have held such a theory.

Raymond Boudon states that Pareto thought that ideologies were rationalizations of feelings, and outlines what he conjectures to be the general argument behind Pareto's theory:

1. **people believe in the objective truth of all kinds of propositions, both unproved and unprovable;**
2. **by definition, their conviction cannot be founded on the objective truth of these propositions;**

3. **therefore it must have its basis in an irrational act of faith;**
4. **which can only be based on feelings.** (Boudon 1989, p. 60)

Boudon argues that both Durkheim and Weber also held this sort of theory. He makes a good case that it is implicit in Durkheim's discussion of respect for the flag (see below), but Weber's analysis of respect for charismatic leadership attributes a leader's success to his followers' assessment of his actual performance.

The second idea is that what is most important or even necessary and sufficient in the emergence and spread of ideologies is a high level of agitated, usually violent, emotion evoked by the ideologue in potential followers. Those who espouse this view have in mind the turbulent emotions of the parades and rallies that adorn political regimes and the riots and assassinations that attend their demise. Can the emotions that drive the terrorist to plant a bomb, the protester who goes on hunger-strike, and the kamikaze pilot all be rational? Surely, it is thought, such emotional people, especially the violent ones, are outside the scope of abstract theory and argument, and therefore beyond the reach of criticism.

Even if ideologies appeal to emotions and passionate moral aspirations, this is no insurmountable obstacle to abstract critical argument. Even the most violent and anti-intellectual ideologies are steeped in abstract theory and argument, and their origin and spread is traceable to conspicuously intellectual sources. All the great ideological movements have had rather undramatic beginnings with the writing of an abstract text by some obscure scribbler fascinated by some abstract problem, and they have been sustained or demoralized by abstract argument.

The intellectual content of even anti-intellectual ideologies is no surprise once it is realized that all emotion is cognitive and all cognition is emotional. There is no thoughtless emotion, and no emotionless thought. All thoughts, even of particular things, can only be constructed from abstract ideas and arguments. It seems implausible to suggest that anti-intellectual ideologies arouse people on account of being empty of meaning. It is hard to avoid meaning. Even 'nonsense' poetry or humor excites us on account of the meaning that we impute to it. Caroll's "Jabberwocky." for example, contains many words that are not in the dictionary or part of any natural language, yet the poem conjures up in our mind all sorts of strange creatures.

Some writers, such as Durkheim, might say that since at least some emotion is instigated by particular objects, abstract theory is sometimes irrelevant. If this type of emotion were responsible for maintaining ide-

ologies, then they would be immune to theoretical attacks against the emotion. However, Popper has argued that even the identification of particular objects involves abstract theory that goes beyond the immediate observational data. Popper argues that even to describe something as simple and concrete as a glass of water involves attributing to it a set of dispositions that have not yet been fulfilled:

> The statement, "here is a glass of water" cannot be verified by any observational experience. The reason is that the universals which appear in it cannot be correlated with any specific sense-experience. . . . By the word "glass", for example, we denote physical bodies which exhibit law-like behavior, and the same holds for the word "water". (Popper 1934, p. 95)

This is a broad notion of theory, but a defensible one. The extension of the notion of theory is parallel to the extension of the notion of information, allowing us to speak of computer programs or genes as containing information. Indeed, just as the concept of information has been severed from its connection with language, Popper's broad notion of theory allows us to conjecture that even a cat and mouse have instinctive theories about each other's law-like behavior, theories which guide their responses to one another. A corollary is that even if an ideology or some of its components are non-linguistic responses to particular objects, as their emotional elements might be, a theoretical attack may still be appropriate.

Even if we admit that ideological emotion can sometimes spring from particular objects, this does not by itself make the ideology immune to theoretical criticism. A better example in this context would be the statement 'This is my father'. A father is clearly a particular object that arouses much emotion, but it is a particular object that is only understood through a complex and not easily testable theory, a theory that goes far beyond immediate experience. One can easily see how this line of argument can be extended to straightforwardly ideological notions such as 'leader', 'follower', 'heretic', 'class traitor', and so forth. Thus theories that ascribe the success of an ideology to a charismatic leader who arouses deep emotions, or to a particular object such as a flag cannot exclude the relevance of theory to that propagandistic success. For it is the theories held by the leader's audience that makes him a charismatic leader and that endow the flag with its emotional significance.

Thus I agree with the Stoic idea that "men are not moved by things but by the views they take of them" (Epictetus), though I argue (as

Epictetus would no doubt have agreed) that the views we have of things are at least partly explained by the way things are. Therefore the way we feel about things is at least partly explained by the way things are. Perhaps closer to my position is that of Dubois:

> If we wish to change the sentiments it is necessary before all to modify the idea which has produced them. (Quoted in Beck 1976)

I add that changing the ideas is not only necessary but sufficient, and moreover is always possible.

It follows that abstract critical argument is always relevant. On the other hand, emotion does have an effect on the spread of an ideology. So although truth and validity are always relevant they are not the only relevant factors. Nevertheless, I argue that the effect of emotion on the competitive strength of an ideology can be analyzed in terms of a basic theory of advertising, and that such an analysis shows how it need not be a barrier to criticism.

One may distinguish for the purpose of argument between the emergence, maintenance, and abandonment of an ideology. Even if I concede that ideologies spring from and are maintained by noncognitive emotion, I can still argue that critical argument can prompt the abandonment of any ideology. Maintaining an ideology would then be like the reflex function of the heart which continues until voluntary action brings it to an end. Some subset of emotions may be like the reflex functions of the body: they will control certain behaviors without conscious thought, but conscious thought can intervene at any moment to override the reflex, just as a coughing reflex might be consciously suppressed out of regard for etiquette, at a concert or a formal dinner.

We must concede that intense emotion may sometimes impair reasoning, but this does not mean that it eliminates it. Conceding an element of the irrationalist case, I grant that an argument may engender an emotional attitude so intense that some subsequent critical arguments requiring sharp, coherent, complex thought become ineffective. But the proposer of the irrationalist thesis must grant as common observation that intense emotional perturbations cannot last a lifetime, though a disposition to such emotions may. Therefore, there will be times when the appreciation of even difficult arguments will not be prevented by intense emotion. I will also argue that this barrier depends on the correct identification of criticism, which, as we saw in Chapter 1, is not always easy.

Hitler's Theory of Propaganda

Adolf Hitler held that successful propaganda is based on appeals to emotions devoid of abstract content, and in particular to agitated or violent emotions. Hitler is worth quoting at length since, as he was so remarkably successful in achieving power, his views on propaganda are regarded by many as at least close to the truth. Hitler expresses quite eloquently ideas about persuasion still held independently by many worldly-wise intellectuals of all political affiliations.

> The broad masses of a nation are not made up of professors and diplomats. Since these masses have only a poor acquaintance with abstract ideas, their reactions lie more in the domain of the feelings, where the roots of their positive and negative attitudes are implanted. They are susceptible only to a manifestation of strength which comes definitely either from the positive or negative side, but they are never susceptible to any half-hearted attitude that wavers between one pole and the other. The emotional grounds of their attitude furnish the reason for their extraordinary stability. It is always more difficult to fight successfully against faith than against knowledge. Love is less subject to change than respect. Hatred is more lasting than mere aversion. The driving force that has brought about the most tremendous revolutions on this earth have never been a body of scientific teaching which has gained power over the masses, but always a devotion which has inspired them, and often a kind of hysteria which has urged them to action. (Hitler 1939, p. 283)

According to Hitler, the most successful movements are those with the most intense or agitated, abstractionless emotion behind them, for these are most lasting intrinsically, and the most resistant to any counter-appeals. I suspect that many theorists have been influenced by this view of ideological change.

Edmund Wilson, famed for his eloquent exposition of Marxism, expressed his predilection for a similar theory of propaganda and ideology:

> You cannot reason an English Tory into a conviction that the lower classes are not unalterably inferior to the upper; and it would be useless to dispute with a Nazi over the innate inferiority of non-Nordics. . . . you can only appeal to them by methods which, in the last analysis, are moral and emotional. (Wilson 1967, p. 389)

It was, in Wilson's view, Marx's moral genius, inherited from his Jewish background, to have grasped this truth and exploited it to the full. The persuasive power of Marx's *Capital*, we are to believe, has no connec-

tion with its claims in economic theory, or its historical assertions; it lies rather in its ability to instil a moral fervor to abolish capitalism and institute communism. Zombie-like the proletariat or its leadership somehow acquires from *Capital* a hatred for capitalism and on they march to the revolution.

It's surprising that Wilson should have overlooked cases such as William Ewart Gladstone, the greatest of English Liberal politicians, who began his parliamentary career as a High Tory, and reasoned his way out of Tory doctrine and into classical liberalism, to which he then made an enormous practical contribution.

The idea that one cannot reason with a Nazi or a racist is one of the key ideas behind the intimidatory tactics of many left-wing student groups. These groups reject free speech. Their resort to physically obstructing those who want to attend a speech by a racist or chanting during such speeches flows from their disillusionment with argument. But if argument and reason have nothing to do with racism, it is somewhat ironic that they go to so much trouble to suppress arguments in favor of racism. Or is it being suggested that one can be persuaded by argument into racism but not out of it? I have found that, when prompted, some members of these student groups suggest that argument is a waste of time because racism is instinctive. In this vision, Apartheid and Nazi Germany are a product of instinct rather than theory.

Racism may build on an instinctive suspicion of strangers, but such a suspicion is hardly sufficient to explain those particular regimes. Such glib attempts to understand a phenomenon they are trying to eliminate is probably the sad but predictable effect of an inveterate contempt for argument and debate. To such people, racists are animals without any regard to theories and argument, who, therefore, can only be opposed by physical obstruction and censorship.

Intellectual Elites and Emotional Masses

Hitler did see a role for abstract argument and theory in propaganda, but this was confined to the intellectual elite. Serge Chakotin, a socialist leader at the time of the Nazis' rise to power and pupil of the Russian scientist Pavlov, held very similar thoughts on political propaganda.

In his study of totalitarian political propaganda, *The Rape of the Masses*, Chakotin portrays the masses as puppets of leaders, "soul engineers," who supposedly make use of suggestion to manipulate them.

Some of the ideas of Hitler and Chakotin were anticipated by Durkheim in 1915 in his book *Elementary Forms of the Religious Life*.

[4]
Ideologies as Shapeshifters

If we want to guarantee our belief system—our theory or our ideology—against being destroyed by criticism, we may try to formulate it in such a way that it can survive any criticism, because it can be reinterpreted so that no criticism could really touch it.

A crude example would go like this. I predict that the world will end on a certain date. Lots of people believe me, and I attract a big following. That date comes and goes without the world ending. My critics say that I was wrong: what I said would happen did not happen, therefore my belief-system is false. I then scornfully reply that my belief-system is still entirely correct. My critics are making a silly and superficial blunder, because the world really did end on that date (and I intend to go on reporting the fact that the world did end on that date). It's just that the end of the world is not detectable by the normal methods of observation, as my very foolish critics have carelessly supposed.

It doesn't matter here exactly how I develop this idea: I may say that God destroyed the world, and then instantly re-created it exactly as it had been before, or I may say that the new world is different to the old world (which really did come to an end, don't doubt it for a moment) because in the new world certain trends have begun which did not exist before. There are hundreds of other ways I might develop the idea. I might even be very obscure about just how it is to be developed, which would go to show that I am inordinately wise. All that matters here is that I have given an interpretation to my old belief which saves it from being rejected. I deny that I was ever wrong, by giving an interpretation to my old belief which squares it with the criticism it has encountered. Criticism of my belief has been rendered impotent, and my belief has been guaranteed against ever being demolished by criticism. I've won—haven't I?

Immunizing Stratagems

If we frame our theory so that, logically, no possible criticism (or perhaps merely no actual or likely criticism) could touch it, we have immunized it against criticism. The device we use to immunize our theory is called an *immunizing stratagem*. We give our belief-system protection against criticism by setting up a logical barrier to criticism. It may seem that if we can do this, then we will have given our ideology an advantage in the competition of ideas.

My aim in this chapter is not to demonstrate that a system of ideas cannot deflect criticism by logical means, but rather to show the limitations and the costs of doing this. What I will show is that immunizing stratagems either abandon the belief system they're supposed to protect or else lower the survivability of the system.

Karl Popper originally used the term 'conventionalist stratagem', but then adopted the term 'immunizing stratagem' from Hans Albert to describe an aspect of the unscientific methodology of certain ideologies claiming to be scientific: Marxism and Freudianism. Arthur Pap had already anticipated this usage.[27]

Popper argued that Marxism, which was originally an empirically testable theory, had been recast in the form of empirically irrefutable metaphysics. This maneuver, Popper claimed, saved Marxism from refutation and immunized it against further attacks (Popper 1976, p. 43).

Freudianism was, Popper claimed, irrefutable from the beginning. The basic theory of Freudianism does not need any immunization to make it irrefutable. Nevertheless, it does incorporate immunizing stratagems. Popper contrasted Marxism and Freudianism with the theories of Newton and of Einstein which, he said, were full of testable content. Thus Popper's employment of the term 'immunizing stratagem' arose in connection with his attempt to solve the problem of distinguishing scientific from non-scientific (including pseudo-scientific) theories—the demarcation problem. Popper's solution was the methodological rule to allow into science only empirically falsifiable hypotheses. If a theory can be shown to be false by an observation—an empirical test—then it is scientific; if no observation could show it to be false, it is not scientific.

Furthermore, Popper maintained, theory development ought to proceed from less to more testable, meaning more informative, theories. If a theory is refuted and an alternative sought, it had to be more testable, not less, and the more testable the better. For to reduce testability is to reduce knowledge, whereas in science we desire the growth of knowl-

edge. An immunizing stratagem is always a development in theory that reduces testability.

Popper's Examples of Immunizing Stratagems

Popper says that immunizing stratagems save theories from refutation. However, Popper's own examples of immunizing stratagems undermine the claim that an ideology can maintain itself against criticism by logical means. Popper's examples are not examples of saved theories but of repudiated theories: to immunize a theory in these cases is to abandon it.

The two main effects of these immunizing stratagems are saving the theorist from embarrassment at the price of abandoning the original theory, and clouding the issue while reducing information content. The latter obviously interferes with the growth of knowledge. To go back to my earlier crude example, my belief that the world ended on a certain date is really a new belief, because when I predicted the world would end on that date, I actually meant it would end in a way that everyone would be able to observe. The old belief has been replaced by a new belief, which is formulated in the same words as the old belief. The verbal formula has been saved, but the actual belief is different. I think that Popper was dimly aware that immunizing stratagems do not strictly save theories (in some cases he puts the word 'saved' in scare quotation marks), but he did not see the full implications of this, especially for the survival of an ideology.

Consider the simplest of Popper's examples. Popper asks us to consider the case of a man who makes the bold claim that all swans are white, and on being presented with a black swan promptly denies that it is a swan. After all, this man says, whiteness is part of the definition of the word 'swan'. Popper states that the theory that all swans are white has been 'saved' from refutation. But has the theory really been saved? What had been an empirical theory about the world has now been turned into the application of a definition. The original theory, supposedly protected by the immunizing stratagem, has actually been replaced by an implication of a vacuous definition.

The original theory was empirical in Popper's sense: it was capable of clashing with observable reality. The statements 'All swans are white' and There is a black swan' cannot both be true. A definition or implications derived exclusively from a definition, however, cannot clash with reality for they say nothing about the world, only about the way we choose to describe the world. The statement, 'All swans are white', which used to convey information about how the world is, has been

transformed into a statement which tell us nothing about the world, but only about how we shall use the word 'swan'. The original theory implied: 'You will never come across a black swan'. The new theory implies: 'You cannot possibly come across a black swan because we have redefined the word 'swan' so that being white is part of being a swan'. Thus the original theory has been repudiated, although the words of the original theory ('All swans are white') have been preserved. The repudiation is implicit and unacknowledged, thus saving face despite abandoning the original claim. Once this point is seen, we can derive some implications about the evolution of an ideology under criticism.

In real life people do not simply make such bold assertions out of the blue. Rather, they are made with a certain intention, background assumptions, and more or less clearly formulated problems. It is this context of assumptions and problems that both guides us in identifying an immunizing stratagem and in refuting the original assertion. For example, the sentence 'All swans are white' might be derived from a biological theory of coloring in birds. Knowing this allows us to exclude a whole range of immunizing stratagems that contradict this biological theory or seem to make irrelevant the intention of maintaining the biological theory as a solution to the problem of coloring in birds.

Provisionally, we may define an immunizing stratagem as an evasion of falsification by the reinterpretation of a theory or the modification of its assumptions so that the modified theory is then consistent with the critical evidence. The reinterpretation or modification must consist in a reduction of information content, which is defined as the class of all and only those statements that are logically excluded by the theory.

Scientific development can be described in terms of concepts, theories, problems, method, and evidence. We can classify immunizing stratagems with respect to these categories.

Conceptual immunization. For example, conventionalist interpretations of Newton's laws of motion portray them as definitions and thus taken alone these laws could not contradict the results of any imaginable experiments.

Theoretical immunization. A theory that is contradicted by a true observation report, *e*, may be weakened just so that it no longer implies not-*e*, or it may be weakened in this way but also strengthened by the addition of a new auxiliary hypothesis so that *e* becomes a consequence of the altered theory. (The theory cannot be made consistent with *e* simply by adding extra assumptions, something I examine below.)

Immunization through change in problem. A theory may escape a specific criticism by a change in the problem supposedly being solved by the theory. We will see that Freud does this with his theory of dreams in order to deal with the contrary evidence of anxiety dreams.

Methodological immunization. One's theories might be associated with a method which, either deliberately or unwittingly, excludes certain domains of potential falsifiers. For example, if a Freudian only considers evidence from the couch, then, providing he sticks doggedly to this method, lots of non-analytic evidence will be made impotent. He may be alarmed to discover that he has been wrong for many years, or he may be simply ignorant of the relevance of such evidence.

Immunization by reinterpreting or denying the evidence. The evidence itself may simply be denied or reinterpreted. (A report of a black swan may be put down to hallucination.)

Metaphysical immunization. One's theories may be attached to a metatheory that interprets them in a certain way. For example, one might combine catastrophe theory with the metatheory that all argument is illusory. (This hybrid is purely hypothetical.) If taken seriously and heeded, this would amount to an exclusion of all possible criticism of catastrophe theory since it would exclude all possible criticism of any theory.

Popper's demarcation criterion is useful methodological advice if our objective is to promote the growth of knowledge. The term 'immunizing stratagem' helps us to designate those moves in theory development that flout the criterion. In other words, if we're interested in gaining new theoretical knowledge, we'd better look our for immunizing stratagems and try to avoid them.

But as protection against criticism, 'immunizing stratagems' possess serious limitations, and certainly do not provide an easy and thorough logical means of ensuring the survival of a theory or an ideology. Many immunizing stratagems involve abandoning the ideology for whose protection they have been introduced, an unplanned, often unforeseeable, process that consists of numerous successive slight modifications extending sometimes over hundreds of years. Other immunizing stratagems seriously lower the survival value of the ideology through the acquisition, sometimes over a long period, of a burdensome and confusing 'protective

belt' of hypotheses, each of which acted at least in the short-run, to deflect criticism away from a privileged sector of assumptions.

Moreover, I see the use of immunizing stratagems not as a sign of an ideology in Bartley's sense, as a complete disregard of truth, but rather of a confused and incompetent attempt to take account of criticism. Those resorting to immunizing stratagems are rather like the American officer in Vietnam who said that a village had to be destroyed in order to save it. Thus I also disagree with Antony Flew. Flew characterizes evasions of falsification as involving "surreptitious" and "arbitrary" maneuvers (Flew 1975, p. 48). They also show "that your concern is with what you would like, rather than with how in truth things are" (p. 54).

My rather different take is that the changes may not be designed, but may be the unintended consequence of an attempt to deal with criticism and retain the theory. To the extent that the maneuvers abandon the original doctrine in response to the specific falsification involved they cannot be wholly arbitrary. This reinforces my point that falsification can act as a Darwinian-like filtering device on ideologies even if evasive (intentional or unintentional) moves occur. It may be that although each successive immunizing stratagem is intentional and introduced in the knowledge that the ideology is being altered only slightly, the whole sequence of immunizing stratagems and their accumulated effect is unplanned and unforeseeable. An analogy with the evolution of language might clarify my point. Even if every change in the language were a conscious innovation, the total effect of all the unintentional ramifications of these intentional changes cannot be foreseen. No one living in medieval England, for example, could have predicted the shape of today's English language.

Can it be correct to say that the introduction of an immunizing stratagem displays complete indifference to the truth? If ideologists are indifferent to truth then why do they employ immunizing stratagems at all? There may well be cynical ideologists who have more dominant concerns than truth, who are more interested in the perpetuation of their doctrine. But their audience is interested in truth. Perhaps the use of immunizing stratagems is an attempt to satisfy these conflicting interests. In any event, whatever the intentions of the propagandist, his audience selects those elements that pass the filters of rationality that I discussed in Chapter 1. The rationality of the propagandist's audience is part of the logic of his situation. Thus I see this chapter as reinforcing my general thesis that truth acts as a Darwinian filter on ideologies.

Marxism and Freudianism are vast rambling structures, so I intend to focus on a small segment of each: Marx's Labor Theory of Value and

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