Persuasion: Civilization's Engine

Convinced that persuasion is civilization's engine, Ray has spent a career explaining why even the most guarded mind can be changed, and that the most tyrannical ideologies can be toppled by argument alone.

BY LOGAN CHIPKIN



Image by Amaro Koberle

Swimming with Ideas

"I can't remember a time in my life when I wasn't thinking about philosophy," says Conjecture Institute Fellow Ray Scott Percival. "I've always wanted to delve beyond the initial questions and puzzles that we bump into in life, whether they be about science, friendship, or even romance, and get to the philosophical heart of the matter. Since I can remember, I wake up every day thinking about philosophical questions. These days, when I go for my bicycle rides in the country, I'm still thinking about philosophy; while I'm hugging a tree, or swimming in a lake, it's always with me."

Ray's academic journey began at Bolton University in his native England, where his study of psychology quickly became a study of the *philosophy* of psychology—in other words, the philosophy of mind. He wanted to know about the mechanism of human thought, of our passions, of how learning takes place. At this time, during the 1970s, behaviorism was on the decline in psychology departments, and alternative approaches such as cognitive psychology were ascendant.

"That turn was fortunate for me," Ray recalls. "I was gradually becoming a Popperian, and behaviorism was antithetical to Karl Popper's philosophy. Behaviorism implies that people are automata, that we can map their behavior with simple algorithms that connect stimuli to responses. But Karl Popper's books, which I was just discovering during my undergraduate days, taught me that people are full of *ideas* that they act upon in wonderfully unpredictable ways."

Introduction to Popper's Theory of Knowledge

Since Aristotle, knowledge was conceived as justified, true belief. This implied that knowledge had to be part of human psychology. However, today, the great bulk of knowledge lies *outside* of people's minds. The invention of writing in ancient Mesopotamia and the emergence of books were key moments in the externalization of knowledge from the human body. Ray calls this knowledge that exists outside of the human mind *exosomatic knowledge*.

The growth of computation, the invention of the Internet by Vint Cerf and others in the 1960s and 70s, and the creation of the Web by Tim Berners-Lee around 1990 have only accelerated this development. One indicator of the staggering growth of exosomatic knowledge is the growth in the number of networked devices that require an Internet Protocol address. On the Internet, every device has an address—computers, obviously, but also now cameras, smartphones, smart pens, etc.

The cultural explosion that started 40,000 years ago led to an accelerated growth in non-psychological or exosomatic knowledge. We have now reached a point where, even if we wanted to, we would not be able to re-embody this exosomatic knowledge due to the information storage limitations of the human brain. This story has been one of the increasing alienation of knowledge from the body and mind and the increasing abstraction of knowledge to make knowledge more transmissible and malleable, making it serve a wider range of purposes more efficiently. Indeed, *most* societal knowledge now exists outside the human mind.

Advanced industrial society cannot now even exist without this literally unthinkable knowledge. This development forces us to revise our philosophical conception of knowledge. Not only does this explosion of exosomatic knowledge break the tie with belief, but it also makes it easier to see knowledge as detached from the personal processes of justification that we associate with it. For example, a modern theory of justification is called Bayesianism, which is a way of adjusting one's degree of belief according to evidence. But if knowledge really is an objective, non-psychological thing, then justification may be irrelevant. This will not lead us astray, so long as our goal is the improvement of knowledge and we employ methods for identifying and removing errors. In other words, we may return to an earlier conception of knowledge, that of the Pre-Socratics.

It is at this point that Karl Popper's theory of falsificationism, and more generally, *comprehensive critical rationalism*, gives us a clearer view of knowledge that suits the alienated character of the overwhelming bulk of contemporary knowledge. Comprehensive critical rationalism holds that knowledge is an objective product of the human mind, but once produced, it has an independent existence, has unforeseen content, and can be more or less true. Truth takes the place of justification as the goal. The control of error in science is executed by severe observational tests in attempts to falsify hypotheses. The control of error in our ideas more generally is executed by criticism and replacing worse ideas with better ones.

Falsificationism is Karl Popper's proposed methodology of science. It was proposed to answer what Popper took to be the two fundamental problems of the theory of knowledge. The first of these questions is: How do we separate genuine science from non-scientific and pseudoscientific theories or activities? This is the demarcation problem. The second question is: How do we promote the growth of knowledge?

There are two valuable things about falsifiable theories. The first is that the more falsifiable they are, the more they tell us about the world. The argument for this is that a falsifiable theory is falsifiable on account of its prohibiting that range of states of affairs that, if true, would refute the theory. This fits well with our preference for precise and general theories over vague and less general theories. The more a theory is both precise and general, the more states of affairs it prohibits. For example, the theory that all planets orbit their star in ellipses with the star at one focus prohibits more states of affairs than the theory that all the planets in our galaxy orbit their star with an elliptical path. Secondly, if a falsifiable theory were false, there would be a way of refuting it and ejecting it from what we provisionally classify as the body of truth or knowledge.

Popper later generalized this approach to all rational discussion in the form of critical rationalism. The idea here is that any position can be discussed rationally. Even if non-scientific theories cannot be subjected to our toughest test of observational falsification, they can, nevertheless, be discussed. Why? The answer is that we can use other intellectual standards to act as the test, such as those of logical internal consistency, addressing the problem appropriately, and consistency with scientific knowledge. Again, there is no presumption of justification because we are using the standard as something against which to match the proposed position: if it fails to match, it fails the test; if it matches, nothing follows. (A key development in this approach was Popper's acceptance of W. W. Bartley's clear distinction between the goals of truth and justification.)

At least on empirical questions, justification was seen as an observation, which in turn was a controlled experience. In Francis Bacon's view, called induction, the world is conceived as an open book that the mind can read by repeated observations. We just have to be careful readers and avoid the biases of our prejudices. Bacon was trying to move away from the syllogistic method of the medieval schoolmen and defined his alternative procedure as one "which by slow and faithful toil gathers information from things and brings it into understanding."

Inductivists assumed that the repetition of observation with variation produced and formed the premises for the inference to explanatory theories. The inductivist recipe was: first collect the data and then infer the corresponding general theories.

However, inductivism (and all other variants of justificationism) was to encounter many fundamental problems. For example, the inductivist cannot rely on induction to justify induction, because he would immediately face an insurmountable dilemma. For a justificationist, one should only adopt those positions that can be justified. However, every justification is an argument with premises. Now, an argument is itself a position and therefore demands justification. If one demands that the premises must be justified, then one initiates an infinite regress of justification. On the other hand, if one stops at some point, one embraces a dogmatic position.

Popper's falsificationism, and its more inclusive general approach, critical rationalism, does not face such a problem. Critical rationalism proposes the attitude: you may be right and I may be wrong, but with a little mutual criticism we may get nearer to the truth. This does not initiate an infinite regress of justifications because it does not presuppose that it can be justified. Instead, it sees *truth* as the goal of rational inquiry, not justification. It merely opens itself up for criticism, arguing that all positions, including itself, are in principle criticizable (although not necessarily successfully so). Therefore, comprehensive critical rationalism avoids both infinite regress and dogmatism.

The Reach of Popper's Philosophy

The first book of Popper's that Ray picked up was *The Open Society and Its Enemies* (Volumes I & II), which is not about Popper's philosophy of knowledge (or *epistemology*) per se but rather applies it to issues pertaining to society and government. "It's a magnum

opus, really," Ray reflects. "Decades later, I still go back to it and extract new implications and further insights that I graft into my own writings."

Central to Karl Popper's epistemology is that errors are inevitable in all of our ideas. Because of this, we should construct our theories in such a way that the detection of errors is possible. In science, then, our theories should be *falsifiable*—there should exist an experiment one of whose possible outcomes contradicts the theory's prediction. A *crucial experiment* is one whose outcome contradicts the predictions of all but one of the competing theories on offer. Those theories whose predictions contradict the experimental outcome are thereby falsified, and the theory whose predictions are consistent with the experimental outcome is *corroborated*.

On Popper's account, our theories remain conjectural and open to correction. We can make progress by identifying errors and developing theories that come closer to the truth (Einstein's theory of gravity, for instance, comes closer to the truth than Newton's), and those new theories remain open to correction in turn.

In *The Open Society and Its Enemies*, Popper takes this idea that progress consists of detecting and eliminating error (rather than, say, the attainment of certainty) and applies it to political philosophy. Just as Popper replaced in science the question of "How can I be certain of my theory?" with "How can I detect and eliminate errors in my theory?" he replaced the age-old political question of "How do we ensure that we obtain the right rulers?" with "How can we peacefully remove bad rulers and their policies?" The former invites authoritarianism—once you have the 'right' rulers in place, there is no good reason to resist, and forced obedience is seemingly justified. Popper's criterion, on the other hand, implies the need for institutions like democracy, which allow citizens to peacefully replace one ruler with another (one whom they think would do a better job).

Most generally, Popper's schema for the growth of human knowledge is:

1. Noticing a *problem* (a conflict between some of our theories, a conflict between data and one or more of the theories, a contradiction or ambiguity within one of the theories, a gap between how the world is and how we would like it to be, etc.),

2. then guessing *candidate solutions* (which consist primarily of explanations),

3. then *criticizing* all such candidates (including, but not limited to, via crucial experiments), and finally

4. retaining whichever *solution* has survived all criticisms.

Ray argues that Popper's theory of knowledge has counterintuitive implications for how persuasion works and how ideas spread. In particular, he has spent a career arguing that, contrary to common sense, deliberately shielding one's ideas from criticism can *damage* the idea's ability to spread.

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', the device we use to immunize our theory, as 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.

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 had meant before the introduction of the stratagem.

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. 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. But there are both limitations and costs to doing this.

Contrary to their purpose, immunizing stratagems either abandon the belief system they're supposed to protect or else lower the survivability of the system.

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.

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 both 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 nonscientific (including pseudoscientific) theories—the so-called *demarcation problem*. Popper's solution was the proposal of a methodological rule that allowed 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, from less informative to more informative theories. If a theory is refuted and an alternative sought, it has to be at least as testable as the refuted theory, not less. And the more testable, the better. To reduce testability is to reduce knowledge, whereas in science we desire the growth of knowledge. An immunizing stratagem is always a development in theory that *reduces* testability.

In real life, people do not simply make 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 of 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.

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

2. ***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.)

3. ***Immunization through change in problem.*** A theory may escape a specific criticism by a change in the problem supposedly being solved by the theory. For example, Freud does this with his theory of dreams in order to deal with the contrary evidence of anxiety dreams.

4. ***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 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.

5. ***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.)

6. ***Metaphysical immunization.*** One's theories may be attached to a metatheory that interprets them in a certain way. For example, one might combine Newtonian 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 Newtonian theory, since it would exclude all possible criticism of *any* theory.

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, at least in the short run, deflects criticism away from a privileged sector of assumptions.

Fostering Philosophical Institutions

After earning his undergraduate degree, Ray took a job looking after children, still devouring philosophy in his spare time and only falling further in love with philosophical questions. "But there was no one around me to discuss them with," he recalls.

The solution came in the form of an advertisement for a place at the University of Warwick to do a master's degree in philosophy. Ray applied and was quickly accepted.

"Warwick is where I met Popper's research assistant and collaborator, David Miller," Ray says. "He became my mentor,

teacher, and lifelong friend until his death in 2024. I greatly miss being able to send him my latest drafts for his ruthless criticism." Miller supervised Ray's master's dissertation, on proof-theoretic definitions of the logical connectives.

Ray's network of fellow Popperians came into its own at Warwick. In addition to Miller, Ray befriended Jan Lester, who has applied critical rationalism to the theory of libertarianism.

During this time, Ray came to appreciate the superiority of Popper's epistemology to the alternatives. "I moved completely away from the logical positivists, who thought that the only meaningful statements were those that could be empirically verified," he recalls. "Of course, such a philosophy rules itself out as meaningless. And Popper's emphasis on real problems made much more sense than Ludwig Wittgenstein's insistence that all problems were just a matter of language. Popper explained that problems really do exist, and that we can solve them."

Ray then earned his doctorate at the London School of Economics, Popper's longtime academic home. Supervised by Kenneth Minogue, his thesis, *Openness to Argument: A Philosophical Examination of Marxism and Freudianism*, took on the two systems of ideas that Popper had famously accused of evading criticism (see "Immunizing Stratagems"). Ray was awarded his PhD in February 1992, and his doctoral research would lay the groundwork for his own eventual magnum opus (see "The Myth of the Closed Mind").

Ray has also spent much of his career building institutions where ideas can be criticized. From 1988 to 1998, he chaired and organized the Annual Conference on the Philosophy of Sir Karl Popper at the LSE. He served as associate editor of *The Popper Forum* under Fred Eidlin from 1993 to 1995, and sat on the editorial board of the *Journal of Social and Evolutionary Systems*, edited by Paul Levinson, alongside Noam Chomsky, Gordon Tullock, Donald T. Campbell,

Ian Jarvie, and Gerard Radnitzky. He also became a central part of the Libertarian Alliance in London.

His most far-sighted project came while the Web itself was still taking shape. At the Popper conference in March 1995, Ray announced plans to bring Popperian scholarship online, and Barry McMullin of Dublin City University offered to collaborate. Together they established *The Karl Popper Web*. As part of it, Ray founded *The Critical Rationalist* (1995–1998) and served as its editor-in-chief. It was among the pioneering peer-reviewed electronic academic journals, launched when surveys counted such journals only in the dozens, and its editorial board included David Deutsch and Frank Tipler. Ray also founded and moderated *The Critical Café*, an email discussion forum in which leading Popperians actively participated.

Supported by the Open Society Institute, Dublin City University, and other sponsors, *The Karl Popper Web* won an Encyclopedia Britannica Internet Guide Award in 1999 and was later included in the WiderNet Project's eGranary Digital Library. Ray himself was listed in *Baron's Who's Who: The Global 500—Leaders for the New Century* (1999–2000), with a preface by Arthur C. Clarke.

Alongside this institutional work, Ray published research on themes that run through his books: Jung and evolutionary theory; Richard Dawkins, mind viruses, and rationality (see "The Myth of the Closed Mind"); and Donald T. Campbell's evolutionary epistemology and Popper's World 3. His 1996 paper, "The Metaphysics of Scarcity: Popper's World 3 and the Theory of Finite Resources," explored the unfathomable content of knowledge and its implications for invention and resources, a thread he continues to pull today. In 1995, Campbell invited him to a special LSE discussion group on the uses and limits of biological analogies for understanding scientific development. Ray has also written for *Nature*, *New Scientist*, and the *Times Higher Education Supplement*, and has spoken at institutions including the New School for Social

Research, Bielefeld University, the Czech Academy of Sciences, and Edinburgh University.

Through it all, Ray has kept writing and collaborating with fellow Popperians, such as David Ramsay Steele. “I live in a world of ideas, which makes me very happy,” he says.

After teaching MA philosophy courses at Lancaster University in 1995–1996, Ray spent eight years as Assistant Professor of Philosophy at United Arab Emirates University, from 2004 to 2012, teaching logic, critical thinking, and the philosophies of language, mind, and science. His educational videos and podcasts there won an award in 2009. It was during this period that he developed his doctoral research into his first book, *The Myth of the Closed Mind*, published in 2012—two decades after he completed his thesis.

The Myth of the Closed Mind

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 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 this is true, 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 it must be conceded 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.

Ray's view—admittedly outlandish and extremely unpopular—is that people just can't help being rational. In saying that people are rational, Ray is 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 does Ray mean that everyone has the same opinions as everyone else or can easily be brought around to another person's 'obviously' correct opinions. To the contrary, Ray maintains 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 others', and to cling to these opinions quite stubbornly. When Ray says that people can't help being rational, he means 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.

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. You can 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. It is extremely difficult, if not impossible, to actually achieve 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).

The Main Arguments for the Closed Mind and Their Rebuttals

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: 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.

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: People don't believe everything they wish were true. Everyone believes in thousands of factual states of affairs they would prefer to be different. 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.

3. ***Linguistic or conceptual frameworks.*** 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.

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.

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.

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 relies on 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.

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.

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 that those who claim to have faith and to be beyond reason are actually tacitly aware of the tremendous force of 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, people do not act like scientists.

Rebuttal: The fact that people can improve their logic and take account of the cost of judgment hardly makes them closed to 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*. 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 to. Therefore, it seems, people infected by these mind viruses are impervious to argument.

Rebuttal: 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 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.

9. ***Dumb decision rules.*** 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.

Rebuttal: Fine though this literature is at displaying the 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 give them names, we can escape and even prevent them. So all such errors are open to argument.

Rekindling the Fires of the Enlightenment

Since becoming a Conjecture Institute Fellow in 2025, Ray has been working on a new book, *Enlightenment and How to Get There*, that aims to rekindle Enlightenment values in the modern age, a project far more intimately connected to sound epistemology than one may naively assume.

If *The Myth of the Closed Mind* was Ray's application of Popper's epistemology to explaining how persuasion does and does not work at the level of the individual, *Enlightenment and How to Get There* is Ray's application of critical rationalism to the conditions under which institutions can and cannot foster progress.

"To me, critical rationalism is the core of the Enlightenment project," Ray says. "The Enlightenment is about the long-term flourishing of mankind, which requires that we be more creative and grow our knowledge most effectively. And to do that, we need to get our epistemology right."

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