follow the stream, we'll come back to the mansion,' there's only one way to tell for sure if that sentence is true or not."

"Follow the stream," said Laura.

"Not quite," Lisa answered. "We had to make a guess where the stream led to. Look, we knew for a fact that the mansion was on the river. And we knew for a fact that we were on the stream. Now the best guess we could make was that the stream led to the river. So we just went with our best guess. We tried it out, and sure enough, we found our way back to the mansion! Don't you see? Our idea was true because it worked!"

But Tony and Mark exclaimed together, "No, it worked because it was true!"

Excerpted from Matthew Lipman, Lisa *(Montclair, NJ: Institute for the Advancement of Philosophy for Children [IAPC], 1983): 110–114. This novel and its accompanying manual,* Ethical Inquiry *(1985), are part of the pre-college philosophy curriculum developed by Matthew Lipman and Ann Margaret Sharp at the IAPC*

FIRST PLACE WINNER

An Argument in Favor of Operative Truths

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America, 2018: Seated at the front of a courtroom, an eyewitness testifies to a crime. Based on the testimony, a defendant is convicted. The British Isles, 1649: Oliver Cromwell, Lord Protector of the Commonwealth of England, believing himself an emissary of God, oversees the brutal conquest of Ireland and the massacre of thousands of Catholic civilians. A sailing ship, 1747: a group of sailors, to whom food, cider, and vinegar are provided, suffer from scurvy. Another group (beneficiaries of physician James Lind's lucky hunch) is given citrus fruits, and avoids the disease. You, the reader, may be scratching your head trying to connect a courtroom, a dictator and a ship: these three vignettes may seem completely unrelated, yet they are linked by an unseen thread. All three realms—law, religion, and science—have been indelibly marked by humankind's incessant desire to seek (and proclaim) the "truth," and that pursuit can take many forms. The search to answer the question, "What is the truth?" animates the very heart of many of humankind's most important quests, and history provides illustrations of the different ways we have attempted to answer it. "The Riverboat Trip" presents a few. Some people, like Mark, employ inductive reasoning to arrive at the truth: they take a data set or circumstance and infer that, under similar circumstances, the same result will be repeated. Others, like Tony, employ critical rationalism, attempting to disprove concepts or assumptions. Still others, like Lisa, utilize what is popularly known as the "scientific method," creating hypotheses and attempting to verify them through repeated experimentation. Unfortunately, each of these approaches has significant limitations. In this paper, I will argue that the idea of a supreme and objective truth is ultimately unrealistic, unproductive, and unattainable. Instead, I will argue that what I'll call operative truths are the most practical and least fallible type of truth: they advance our understanding and enable us to move asymptotically closer to the abstract notion of "absolute" truth.

To return to our courtroom example: for decades, eyewitness accounts were thought to set the gold standard in terms of unimpeachable truths upon which both judges and juries could rely. When Mark splashes water in Stottlemeier's face, it seems undeniable that both Stottlemeier and Mark could testify to the "truth" of its having been wet: they are contemporaneous witnesses to both the event and to the "truth" that when water is splashed, it feels wet. Similarly, if a woman testifies that she saw a passenger in a moving vehicle shoot a bystander and that she is positive she can identify the shooter (and if we take it as given that she is attempting to tell the truth), her statement would seem unequivocal. Yet, modern researchers such as Hal Lilienfeld and Scott Arkowitz tell us that eyewitness testimony is subject to many kinds of fundamental errors. How can this be? How can a truth that we "see with our own eyes" be shown to be false? One reason, of course, is that our memory for past events—even those that have occurred recently—has proven to be remarkably faulty under certain circumstances: fear, preconceptions, racial prejudices, the presence of a weapon, and even the act of retelling have all been shown to alter our memories. It is clear that just because we remember perceiving something to have happened in a certain way does not mean that it actually did. Data gathered through observation—unless recorded and reported instantaneously—is inevitably suspect, because its accuracy is contingent upon our fallible memories and perceptions.

Aside from the problem that memory introduces (when considering evidence gathered through observation), the notion that we can utilize observations to prove truths is in and of itself flawed. First, let's review what we mean by observations. If we consider an "observation" to be the direct recording of data from the world around us, they can be made through our human senses but also with the aid of instruments. In the realm of science, such observations

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Argument in Favor of Operative Truths (continued)

can then be used to help aid our understanding of naturally occurring events. However, what they cannot do is lead us to definitive conclusions, or "truths." Of course, some branches of science rely heavily on the use of observations, and these observations often provide us with valuable data from which we can form hypotheses. For example, scientists examine tree rings to inform their assumptions about weather conditions in the past. However, the notion that past observations can be used as proof of future outcomes is false. This argument employs a circular logic in that it implies that we believe nature to be uniform because it has been uniform in the past. In addition, human beings seem to have a predisposition to find patterns where none exist—one great example of this is the infamous "hot hand fallacy," or the notion that a basketball player can be in a "zone" in which their ability to make shots is better than usual. Nobel prize winner Daniel Kahneman confirms the consensus view among researchers that the hot hand is a cognitive illusion. Therefore, an inductive reasoner's bottom-up approach, in which observations form a pattern and then the pattern is used to develop a theory, must be rejected as an imperfect way of determining what is "true."

Tony's approach to finding the truth, on the other hand, could be characterized as "top-down" or critical rationalism. Rather than stating that something is "true," (implying that it will continue to be true or accurate in the future), Tony instead proposes a method in which a concept is put forth in order to be tested for falsification: "When I woke up, I realized I couldn't have spent the night in China, and not remember travelling there. . . . So what happened in the dream wasn't consistent. . . . It wasn't consistent, so it wasn't true—it's as simple as that!" This method initially seems appealing because it helps us to avoid the trap of circular logic described above and creates a framework in which a single piece of contradictory evidence is enough to disprove a hypothesis (thus also having the merit of being remarkably efficient). Unfortunately, though, while effective at disproving false suppositions, critical rationalism does not really provide us with a standard at which the "right" amount of corroborating or supporting evidence can be deemed enough to verify any claim of truth. In other words, a skeptic could argue that we simply haven't yet found the piece of contrary evidence to prove a claim wrong (or "not true").

Lisa's method—the aforementioned scientific method—initially seems promising. She creates a testable hypothesis: "Why don't we take a chance that this stream flows down to the river that we came up here on?" and in fact, the stream does lead the group back to the mansion. However, while a hypothesis is testable, it is not possible to prove that it is true. A well-crafted hypothesis is falsifiable (it makes a statement that can be shown to be wrong), but we can never prove that it is true—bringing us back to the induction problem. Additionally, hypotheses can themselves inadvertently guide scientists to frame their experiments in a way that is biased or more conducive to a certain result. For instance, a wrong hypothesis may lead a scientist to exclude (or not consider) relevant data, instead ascribing an experimental result to the (included but incomplete) data set.

Finally, we need to consider the concept of axiomatic truths—truths than can be accepted without any argument or need of proof. These make an oblique appearance in the case when Lisa asserts "We knew for a fact that the mansion was on the river. And we knew for a fact that we were on the stream." In this instance, these axioms are relatively benign (although we could argue that the group did not, in fact, "know" that they were on a stream that was definitely a tributary of the larger river they had just visited—it's conceivable that, instead, it fed into another nearby river). However, it is not only problematic when axioms prove wrong: history has shown us that at least some axiomatic "truths" can also prove extremely dangerous. The fanatical Puritan despot Oliver Cromwell, mentioned above, is only one example of a religious leader who rejected the idea that belief should rest on demonstrable evidence. Many of his cruel actions were motivated by beliefs he felt were axiomatic to his Puritan Christian faith, because he was certain he had a mandate from heaven.

Given the shortcomings of the approaches taken by Mark, Tony, and Lisa (as well as countless others throughout human history, such as Cromwell) I propose an approach that utilizes what I will call operative truths—which may either be a model or, in cases where we don't have enough data, a question. We don't need to think of these operative truths as supreme or objective or absolute: they are useful until we come up with something even better. We ask a question, or propose a model, and either receive an answer or use the model until our experience shows us that it requires refinement. Take, for example, the atomic mass of carbon. This is an estimate—it is a weighted average of all carbon isotopes—yet we use it all the time to great effect. This is an example of an operative truth that works well enough until we can get a better estimate. "Truth" is an asymptotic progression towards something that is ultimately unattainable. Therefore, the definition of truth that we must use is that which can be known with the most certainty at this time. We can get very close to the "truth" through refinements that we can and should strive to make: each refinement inches us a little closer to our goal of "knowing."

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