
Beyond a Reasonable Doubt

In our courts two standards are set for the verdict to be rendered by a jury. On questions of fact that the court submits to the jury, the jury is sometimes required to give an answer that it holds beyond a reasonable doubt; and sometimes it is sufficient if the jury's answer is one that it thinks is supported by a preponderance of the evidence.

Aristotle made a somewhat similar distinction between two ways in which we can answer questions of all sorts. Like the jury's answer that is beyond a reasonable doubt, we sometimes can answer a question by a statement that has the status of knowledge. When our answers do not consist of knowledge, Aristotle calls them opinions. Opinions approach knowledge to the extent that they have the weight of the evidence on their side. At the very opposite end of the scale are those opinions that are totally unsupported by evidence.

Aristotle's distinction between knowledge and opinion is a

very sharp one—too sharp, perhaps, for us to accept without qualification. For him, when we have knowledge, what we know consists of necessary truths. We affirm such truths with certitude because they are beyond all reasonable doubt. For example, we cannot doubt that a finite whole is greater than any of its parts. If something is a finite whole, it must be greater than any of its parts. It is impossible for it not to be.

Such self-evident truths constitute one example of what Aristotle means by knowledge. The other example consists of conclusions that can be validly demonstrated by premises that are self-evidently true. When we affirm such conclusions, we not only know *that* what they assert is true, but we also know *why* what they assert is true. Knowing the reasons why what they assert is true, we know that what they assert cannot be otherwise. Here, too, we are in possession of necessary truths.

Aristotle in his day thought that mathematics, especially geometry, exemplified knowledge of this high quality. The view that is held of mathematics in our day does not agree with Aristotle's. Nevertheless mathematics comes nearer than any other science to exemplifying what Aristotle meant by knowledge.

Considering the truths of geometry, we can understand one other distinction that Aristotle made between knowledge and opinion. There are two ways, he says, in which one can affirm the conclusion of a geometrical demonstration. The teacher who understands the demonstration affirms the conclusion in the light of the premises that prove it. He or she has knowledge. In contrast, the student who does not understand the demonstration but who affirms the conclusion only because the teacher said it is true does not have knowledge. Even if the truth itself is a necessary truth, to affirm it on the authority of someone else is to hold it as a matter of opinion rather than as knowledge. For most of us, the scientific truths with which we

are acquainted are opinions we hold on the authority of scientists, not knowledge that we ourselves possess.

We may find this way of distinguishing between knowledge and opinion more useful as well as more acceptable. Only a very few statements are necessary truths for us because they are self-evidently true, and their opposites are impossible. All other statements express opinions that may or may not be true. Though Aristotle would call all statements of this sort statements of opinion rather than of knowledge, let us see whether we can divide opinions into two groups, one of which has some resemblance to what Aristotle meant by knowledge.

The opinions we hold may either be supported by reasons and by observations, or they may be held by us without such support. For example, if I hold an opinion only because someone else told me it was true, and I myself do not have any other reason for thinking it to be true, then that is a *mere* opinion on my part. The statement may in fact be true. That does not make it any the less a mere opinion. So far as affirming it is concerned, I have no grounds that provide me with reasons for thinking it to be true apart from the authority of someone else.

Each of us also has a number of personal prejudices—things we hold to be true simply because we want to believe them. We have no rational grounds for believing them. Instead, we are emotionally attached to them. For example, persons often believe that their country is the best country in the world. That may or may not be true. It may even be possible to argue that it is true by citing evidence of one sort or another or by giving reasons for thinking so. But persons who believe this usually do not cite evidence or give reasons. They just wish to believe it.

The statements to which one is emotionally attached by such wishful thinking are mere opinions. Other persons may be emo-

tionally attached to opinions that are opposite. Since neither one opinion nor the other, which may be its very opposite, is supported by reasons or evidence, one opinion of this sort is as good as another.

In the case of mere opinions, everyone is entitled to prefer his or her own—those to which the individual is emotionally attached. About such opinions there can be no argument, at least none that is rational. Opinions of this sort are like expressions of personal taste in food or drink. You may like orange juice better than pineapple juice, and I may prefer pineapple juice to orange juice. You are entitled to your likes, and I to mine. There is no point in our arguing about which is better.

Differences of opinion become arguable only when the opinions about which we differ are not mere opinions in the sense just indicated—only when they are not simply personal prejudices, expressions of taste, or things that we wish to believe.

For example, I may have good reasons for thinking that harnessing the energy of the sun will provide us with sufficient energy when we run out of fossil fuels such as coal and oil. You may have good reasons for thinking that solar energy will not solve the problem. Each of us, in addition, may be able to cite statistics provided by careful studies of energy sources. Neither of us may be able to persuade the other. Nevertheless, the opinions we hold and about which we differ and argue are *not* mere opinions on our part.

Let us suppose that neither of us has studied the energy problem ourselves. We have simply read what has been said by others on the subject. The opposite opinions we hold are based on the authority of others. Let us further suppose that you have most of the authorities in this field on your side; or that of the authorities that can be appealed to, you have the most expert on your side. Aristotle would say that you have the stronger case.

In his view, the opinion that is held either by most men, or by most of those who are experts, or by the best-qualified among the experts, is likely to turn out to be the better opinion to hold.

We approach nearer to what Aristotle meant by knowledge, and we move further away from mere opinion, when the opinions held are based on scientific evidence and scientific reasoning. Those opinions that are supported by a preponderance of the evidence and by the soundest reasoning are regarded by scientists in our day as knowledge.

It is not knowledge in Aristotle's sense of the term because what we claim to know may turn out not to be the better of two opposite opinions when, by further scientific investigation, more evidence is found on the opposite side; or when, by further scientific thought, better reasons are found for holding the opposite opinion. No scientific conclusion is known by us to be finally or ultimately true—true beyond the possibility of correction or rejection by further investigation and further thought about the matter.

The opposite of any opinion that we hold as a scientific conclusion always remains possible because no scientific conclusion is itself a necessary truth. Nevertheless, a large number of scientific conclusions have been supported by a preponderance of the evidence and by unchallenged reasons for many centuries. The fact that new discoveries may shift the scales against these conclusions or the fact that the reasons in favor of them may be seriously challenged by new thinking about the subject does not prevent us from regarding such conclusions as well-established knowledge—for the time being.

Are scientific conclusions, supported by a preponderance of the evidence and by the best reasoning that is available at the time, the only opinions we are entitled to regard as knowledge? No. Philosophical conclusions may also be opinions that we are

entitled to regard as knowledge because they are supported by sound reasoning and by the weight of the evidence that is in favor of them rather than their opposites.

How do the conclusions of philosophical thought differ from the conclusions of scientific research? The answer lies in the two words "thought" and "research." Scientific conclusions are based on the investigations undertaken by scientists, whether in laboratories or not. The thinking that scientists do to reach these conclusions never by itself suffices. It is always thinking about the observations or findings of carefully planned and carefully executed research or investigation.

In contrast, philosophical thought reaches conclusions based on common experience, the kind of experience that all of us have every day of our lives without doing any research—without carefully carrying out carefully planned investigations. Philosophers do no research. They do not devise experiments or carry out investigations.

Philosophical thought about common experience begins with the common-sense opinions that most persons hold. It improves upon such common-sense opinions by being more reflective and analytical than most persons are. In my own view of the matter, it reaches its best and most-refined conclusions in what I have called Aristotle's uncommon common sense.

Scientific or philosophical conclusions are usually generalizations from experience—either the special experience that results from research or investigation or the common experience that all of us have without investigation or research. As we noted in an earlier chapter, any generalization can be falsified by a single negative observation. This is as true of a philosophical as it is of a scientific generalization. The longer a generalization goes without being falsified, the more entitled we are to regard it as established knowledge even though we can never

regard it as finally or ultimately true—beyond the possibility of correction or rejection.

Because philosophical conclusions are based on common rather than on special experience, because they are not affected by the results of investigation or research, conclusions of the kind that Aristotle reached more than two thousand years ago can still claim the status of philosophical knowledge in our day. Nothing in our common experience since his time has falsified them.

Most of the scientific conclusions that were currently accepted in Aristotle's day have been rejected or corrected since then. They have either been falsified by the discoveries of later research, or they have been corrected and improved by better thinking as well as by better observations and more thorough investigations.

Not all opinions that can be regarded as established knowledge take the form of scientific or philosophical generalizations from experience. Historical investigation or research reaches conclusions about particular matters of fact—the date when some event took place, the steps by which some individual became a ruler, the circumstances that led to the outbreak of a war, and so forth.

Here, as in the case of science, research amasses evidence about which historians think and, in the light of their thinking, advance conclusions that they regard as supported by a preponderance of the evidence and by good reasons. When they are reached in this way, historical conclusions can be regarded as established knowledge even though further research may change our view of the matter.

We now see that there are at least five different kinds of knowledge, only one of which is knowledge in the strict sense

that Aristotle attaches to that word. That one is the knowledge we have when we understand truths that are self-evident. The other four kinds are (1) the well-founded opinions of mathematical thought—the conclusions that mathematicians are able to demonstrate; (2) the well-established generalizations of scientific research or investigation; (3) the philosophical opinions that are based on common experience and on the refinement of common sense by philosophical reflection; and (4) the opinions about particular facts that historians are able to support by historical research.

All four are opinions in the sense that they are never so firmly established by reasons and evidence that they cannot be falsified or corrected by further thought or new observations. Yet all four are also knowledge in the sense that at a given time they have the weight of the evidence in their favor and the reasoning that supports them remains unchallenged.