The Nature of Learning: Recognition of Different Perspectives

Road to Nicholson Hollow, Shenandoah National Park, Virginia, Library of Congress

Ideas of Interest From "The Nature of Learning"

1. Explain what John Dewey means when he points out, "The ideal of using the present simply to get ready for the future contradicts itself."
2. Samuel Scudder writes, "…what I had gained by this outside experience has been of greater value than years of later investigation…." What is it that Samuel Scudder thinks he learned by studying with Professor Agassiz?
3. If we seek an explanation for a state of affairs, how do we select the relevant facts of the situation? Does an explanatory theory need to be based on *all* of the facts in order to be true?

4. How does Samuel Scudder's experience illustrate the view that philosophy begins when "we don't know our way about?"
5. Discuss whether or not Tycho Brahe and Nicolaus Copernicus see the same thing at dawn.

The Role of Facts In Understanding

Our introduction to philosophical inquiry is designed to illustrate some of the basic methods of thinking about different modes of understanding. Its purpose is not only to present some of the most profound ideas from thinkers of the past but also to suggest specific methods of analysis and to encourage the use of creative thinking. Philosophy is an investigation of the fundamental questions of human existence. Such questions include wondering about such things as the meaning of life, what kinds of things the universe is made of, whether there can be a theory of everything, how we can know what's the right thing to do, and what is the beautiful in life and art. Other disciplines are concerned with these sorts of questions also, but philosophers, more often than not, either attempt to provide adequate reasons and justifications for their beliefs or attempt to clarify and examine the basis for those beliefs.

From the reading…

"…only by extracting at each present time the full meaning of each present experience are we prepared for doing the same thing in the future."

An attempt has been made to select readable and enjoyable essays to help develop these approaches, even though many of the constitutive philosophical sources require slow and careful reading, and some passages are notoriously difficult to interpret. Beginning a study of philosophy for the first time involves a steep learning curve. Even so, there is little doubt that if we do not find doing philosophy interesting now, we are unlikely to employ these methods in the future in the effort to make sense of our lives and careers. As John Dewey has accurately noted:

> The ideal of using the present simply to get ready for the future contradicts itself. It omits, and even shuts out, the very conditions by which a person can be prepared for his future. We always live at the time we live and not at some

> other time, and only by extracting at each present time the full meaning of each present experience are we prepared for doing the same thing in the future. This is the only preparation which in the long run amounts to anything.[1]

Even though it is sometimes tempting to memorize established, useful ways of solving problems, in philosophy it is often counterproductive to do so. Learning by doing is far more interesting and rewarding than applying standard methods by rote and, indeed, is far more likely to enable us to solve different problems in the future.

From the reading…

"…if facts do not have size, shape, weight, color, taste, and so forth, what, then, *are* they? "

In this regard, Henry Hazlitt has provided a useful insight into the dangers of rote learning:

> I remember the story in some educational treatise of an inspector who entered a school room, asked the teacher what she had been giving her class, and finally took up a book and asked the following question, "If you were to dig a hole thousands and thousands of feet deep, would it be cooler near the bottom or near the top, and why?" Not a child answered. Finally the teacher said, "I'm sure they know the answer but I don't think you put the question in the right way." So taking the book she asked, "In what state is the center of the earth?" Immediately came the reply from the whole class in chorus, "The center of the earth is in a state of *igneous fusion*."[2]

The techniques provided in this introductory text can help us avoid being caught up in such a dreary educational scheme.

Solving problems involves more than just formulating hypotheses or possible solutions and then seeking facts or ideas to support or falsify those proposals. Far more important is the realization that very often the nature of a fact depends entirely upon one's world view or conceptual framework. Many times when differing beliefs appear to be factually different, they actually are different only because of the different points of view from which they are apprehended.

Even though people speak about seeking facts, collecting facts, or "sticking" to the facts, the word "fact" proves difficult to define precisely. Facts

1. John Dewey. *Experience and Education*. New York: Macmillan, 1938, 51.
2. Henry Hazlitt. *Thinking as a Science*. Los Angeles: Nash, 1969, 35.

are sometimes assumed to be in the world and therefore to be present for everyone to experience. However, facts are not usefully thought of as physical objects occurring in space-time. The earth being about eight thousand miles in diameter is not an eight-thousand-mile long fact. A football field is one hundred yards long, but that length is not a "short fact" compared to the "long fact" of the diameter of the earth.

Moreover, unlike things or objects in the world in which we live, facts do not have colors. Many interior doors are brown, but the color of the door is not a brown fact. The door is brown, but the fact, itself, is not colored. So we can reasonably ask, if facts do not have size, shape, weight, color, taste, and so forth, what, then, *are* they? If we do not know *what* they are, how can it be said that we know *the* facts? How, then, how is it possible for us to find or seek the facts? What could be meant by these expressions?

Let's first look at an extended example of "fact finding" and then attempt to relate this process to how we learn. Samuel H. Scudder recounts his problems with factual observation when he first began study at the Harvard Museum of Comparative Anatomy under Professor Agassiz.

"In the Laboratory With Agassiz," by Samuel H. Scudder

It was more than fifteen years ago that I entered the laboratory of Professor Agassiz, and told him I had enrolled my name in the Scientific School as a student of natural history. He asked me a few questions about my object in coming, my antecedents generally,[3] the mode in which I afterwards

3. These "antecedents" as elaborated by another former student of Agassiz may be of interest. (We sometimes underestimate the educational processes of the past by comparison with our own.) Professor Shaler writes "The examination Agassiz gave me was directed first to find that I knew enough Latin and Greek to make use of those languages; that I could patter a little of them evidently pleased him. He didn't care for those detestable rules for scanning. Then came German and French, which were also approved: I could read both, and spoke the former fairly well. He did not probe me in my weakest place, mathematics, for the good reason that, badly as I was off in that subject, he was in a worse plight. Then asking me concerning my reading, he found that I had read the *Essay on Classification*, and had noted in it the influence of Schelling's views. Most of his questioning related to this field, and the more than fair beginning of our relations then made was due to the fact that I had some enlargement on that side. So, too, he was pleased to find that I had managed a lot of Latin, Greek, and German poetry, and had been trained with the sword. He completed this inquiry by requiring that I bring my

proposed to use the knowledge I might acquire, and, finally, whether I wished to study any special branch. To the latter I replied that, while I wished to be well grounded in all departments of zoology, I purposed to devote myself specially to insects.

"When do you wish to begin?" he asked.

"Now," I replied.

This seemed to please him, and with an energetic "Very well!" he reached from a shelf a huge jar of specimens in yellow alcohol. "Take this fish," he said, "and look at it; we call it a *hæmulon*; by and by I will ask what you have seen."

With that he left me, but in a moment returned with explicit instructions as to the care of the object entrusted to me.

"No man is fit to be a naturalist," said he, "who does not know how to take care of specimens."

I was to keep the fish before me in a tin tray, and occasionally moisten the surface with alcohol from the jar, always taking care to replace the stopper tightly. Those were not the days of ground-glass stoppers and elegantly shaped exhibition jars; all the old students will recall the huge neckless glass bottles with their leaky, wax-besmeared corks, half eaten by insects, and begrimed with cellar dust. Entomology was a cleaner science than ichthyology, but the example of the Professor, who had unhesitatingly plunged to the bottom of the jar to produce the fish, was infectious; and though this alcohol had a "very ancient and fishlike smell," I really dared not show any aversion within these sacred precincts, and treated the alcohol as though it were pure water. Still I was conscious of a passing feeling of disappointment, for gazing at a fish did not commend itself to an ardent entomologist. My friends at home, too, were annoyed when they discovered that no amount of *eau-de-Cologne* would drown the perfume which haunted me like a shadow.

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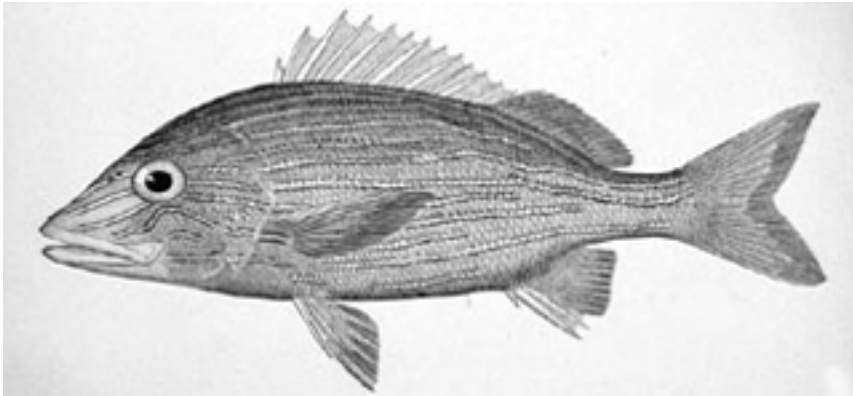
foils and masks for a bout." Nathaniel Southgate Shaler, *The Autobiography of Nathaniel Southgate Shaler*, Boston, MA: Houghton Mifflin, 1907, 93-100. *Ed.*



Hæmulon elegans, NOAA, Drawing by H. L. Todd

In ten minutes I had seen all that could be seen in that fish, and started in search of the Professor—who had, however, left the Museum; and when I returned, after lingering over some of the odd animals stored in the upper apartment, my specimen was dry all over. I dashed the fluid over the fish as if to resuscitate the beast from a fainting fit, and looked with anxiety for a return of the normal sloppy appearance. This little excitement over, nothing was to be done but to return to a steadfast gaze at my mute companion. Half an hour passes—an hour—another hour; the fish began to look loathsome. I turned it over and around; looked it in the face—ghastly; from behind, beneath, above, sideways, at a three-quarters' view—just as ghastly. I was in despair; at an early hour I concluded that lunch was necessary; so, with infinite relief, the fish was carefully replaced in the jar, and for an hour I was free.

On my return, I learned that Professor Agassiz had been at the Museum, but had gone, and would not return for several hours. My fellow-students were too busy to be disturbed by continued conversation. Slowly I drew forth that hideous fish, and with a feeling of desperation again looked at it. I might not use a magnifying-glass; instruments of all kinds were interdicted. My two hands, my two eyes, and the fish: it seemed a most limited field. I pushed my finger down its throat to feel how sharp the teeth were. I began to count the scales in the different rows, until I was convinced that that was nonsense. At last a happy thought struck me—I would draw the fish; and now with surprise I began to discover new features in the creature. Just then the Professor returned.

"That is right," said he; "a pencil is one of the best of eyes. I am glad to notice, too, that you keep your specimen wet, and your bottle corked."

With these encouraging words, he added, "Well, what is it like?"

He listened attentively to my brief rehearsal of the structure of parts whose names were still unknowns to me: the fringed gill-arches and movable *operculum*; the pores of the head, fleshy lips and lidless eyes; the lateral line, the spinous fins and forked tail; the compressed and arched body. When I finished, he waited as if expecting more, and then, with an air of disappointment, "You have not looked very carefully; why," he continued more earnestly, "you haven't even seen one of the most conspicuous features of the animal, which is a plainly before your eyes as the fish itself; look again, look again!" and he left me to my misery.

I was piqued; I was mortified. Still more of that wretched fish! But now I set myself to my tasks with a will, and discovered on new thing after another, until I saw how just the Professor's criticism had been. The afternoon passed quickly; and when, towards its close, the Professor inquired, "Do you see it yet?"

"No," I replied, "I am certain I do not, but I see how little I was before."

"That is next best," said he, earnestly, "but I won't hear you now; put away your fish and go home; perhaps you will be ready with a better answer in the morning. I will examine you before you look at the fish."

This was disconcerting. Not only must I think of my fish all night, studying, without the object before me, what this unknown but most visible feature might be; but also, without reviewing my discoveries, I must give an exact account of them the next day. I had a bad memory; so I walked home by Charles River in a distracted state, with my two perplexities.

The cordial greeting from the Professor the next morning was reassuring; here was a man who seemed to be quite as anxious as I that I should see for myself what he saw.

"Do you perhaps mean," I asked, "that the fish has symmetrical sides with paired organs?"

His thoroughly pleased "Of course! of course!" repaid the wakeful hours of the previous night. After he had discoursed most happily and enthusiastically—as he always did-—upon the importance of this point, I ventured to ask what I should do next.

"Oh, look at your fish!" he said, and left me again to my own devices. In a little more than an hour he returned, and heard my new catalogue.

"That is good, that is good!" he repeated; "but that is not all; go on"; and so for three long days he placed that fish before my eyes, forbidding me to

look at anything else, or to use any artificial aid. “Look, look, look,” was his repeated injunction.

From the reading…

“Facts are stupid things.”

This was the best entomological lesson I ever had—a lesson whose influence has extended to the details of every subsequent study; a legacy the Professor had left to me, as he has left it to many others, of inestimable value, which we could not buy, with which we cannot part.

A year afterward, some of us were amusing ourselves with chalking outlandish beasts on the Museum blackboard. We drew prancing starfishes; frogs in mortal combat; hydra-headed worms; stately crawfishes, standing on their tails, bearing aloft umbrellas; and grotesque fishes with gaping mouths and staring eyes. The Professor came in shortly after, and was as amused as any at our experiments. he looked at the fishes.

“*Hæmulons*, every one of them,” he said; “Mr. ---- drew them.”

True; and to this day, if I attempt a fish, I can draw nothing but *hæmulons*.

Louis Agassiz, NOAA

The fourth day, a second fish of the same group was placed beside the first, and I was bidden to point out the resemblances and differences between the two; another and another followed, until the entire family lay before me, and a whole legion of jars covered the table and surrounding shelves; the odor had become a pleasant perfume; and even now, the sight of an old, six-inch, worm-eaten cork brings fragrant memories.

The whole group of *hæmulons* was thus brought in review; and, whether engaged upon the dissection of the internal organs, the preparation and examination of the bony framework, or the description of the various parts, Agassiz's training in the method of observing facts and their orderly arrangement was ever accompanied by the urgent exhortation not to be content with them.

"Facts are stupid things," he would say, "until brought into connection with some general law."

At the end of eight months, it was almost with reluctance that I left these friends and turned to insects; but what I had gained by this outside experience has been of greater value than years of later investigation in my favorite groups.[4]

Facts and Theories

And we may add to Agassiz's statement, "General Laws are 'stupid' things *until* brought into connection and interrelation with philosophical theories."

Generally speaking, when we seek facts, we are not looking for objects in the world, instead we are genuinely attempting to discover what is true or what is the case about an event or an object. In other words, much of the time, "fact" is used as a suitable paraphrase for "true statement."[5] Some of the time, however, facts are thought to be independent of a world view since newly proposed theories not only can conform to some well-established facts but also can imply the existence of hitherto unknown facts. Whether or not such a view of the relation of facts to theories is

4. Samuel H. Scudder, "In the Laboratory With Agassiz," *Every Saturday* (April 4, 1974) 16, 369-370.
5. Willard Van Orman Quine, *Word and Object*, Cambridge, MA: M.I.T. Press, 1960, 44.

entirely true or not, it *is* true that many facts are dependent on theories for their existence. Hence, it is somewhat simplistic to suppose one must always seek facts in order to explain some puzzling state of affairs because what is the case or what is true is often theory-dependent. Somewhat surprisingly, we will discover that *almost always* our view of the facts "changes" as the theories that imply them change.

Another way to illustrate the difficulties involved with just seeking the facts in order to account for the way things are, is to realize that in any given situation, we simply cannot collect *all* the facts, even though our initial presumption is we should leave no stone unturned. For example, if we were to try to explain how this page got in this book, we would not go about seeking every related fact before we invoke possible theories of how this "page-event" occurred. The number of facts concerning this page are limitless.

Specifically, it is a fact that each letter of each word is a specific distance from any given letter of another word. Each letter is a measurable distance from any given object in the universe—for example, the distance to a ballerina on a New York stage.[6] The facts relevant to the state of affairs described as "the page being in the book" increase and change over time as the ballerina moves, and, of course, the facts change as we uncomfortably fidget while considering the implications of this example. Therefore, we are able to collect as many facts as we please and still not have them all.

In order to make sense of a given state of affairs in the world, we must select only *some* of the facts—presumably, the relevant and important ones. But how can we know beforehand which of the facts will be relevant and important? We need some sort of criterion or rule for selection. In other words, in order to find the relevant facts, we need a *theory* or at least a few ruling assumptions involving what is appropriate in situations similar to this one. We find out the specific *relevant* facts by applying a theory in order to determine what facts we think should be considered in our explanation. At this point our discussion may have become a bit too abstract for an introductory philosophy reading. Perhaps, a specific example can clarify by illustrating the point of what is meant by saying "facts are normally theory-dependent."

6. Newton's law of gravitation is "Every object in the universe attracts every other object with a force directed along the line of centers of the two objects that is proportional to the product of their masses and inversely proportional to the square of the separation of the two objects."

Facts Are Often Theory-Dependent

Suppose you and your astronomer-friend are camping along the Appalachian Trail in the Blue Ridge Mountains of Virginia. As you awake at dawn from the first sound of stirring wildlife, you sleepily notice a rosy, picturesque sunrise.[7] With a bit of alarm you anticipate rain showers and a muddy hike ahead. As you rouse your friend, you comment, "Look at that sunrise; we're in for trouble." Assume, moreover, your friend dimly responds with a slow yawn, "I see the sun, but there is no sunrise today or, for that matter, any day."

What do you say? Is your friend's statement sensible? Presumably his eyesight is just as good as yours, and evidently he is looking where you are looking. Yet, your friend is apparently claiming he does not see what you see. You see the sunrise; he apparently is stating he does not. Now, is there *any* chance *you* could be mistaken? Let's pause just a moment and see if this exchange makes any sense.

You do see the sun rising today, and you have seen it rise countless times in the past. Your friend, however claims not only is there no sunrise today, but there has never been a sunrise. Is this disagreement a misunderstanding over the meaning of words, a misunderstanding due to personal feelings, or a misunderstanding concerning relevant facts at hand? Also, assuming we know what kind of dispute it is, how should we go about resolving it?

Sunrise in Smoky Mountains, Clingman's Dome, NC

You would have to be a gentle person to think this far without suspecting, perhaps in some exasperation, that your friend is half-asleep, does not

7. "Red in the morning is a sailor's sure warning."

know what he is saying, or has some other kind of brain-trouble. However, in order to make this disagreement a bit more interesting, let us further suppose that your friend is beginning to warm up to the strange looks you are giving him and proposes a bet. If you can convince him that the sun is rising after all, he will prepare all meals and wash all utensils for the remainder of the camping trip; if not, then you will prepare all the remaining meals and wash the utensils.

Would you take the bet? Only a cursory look at the remains of the previous night's repast might be sufficient to convince you to accept the wager. After all, *everybody* knows the sun rises *every* morning whether we see it or not.[8] It is difficult to resist the payoff; you accept the bet and begin thinking about proving your case.

From the reading…

"I see the sun, but there is no sunrise today…"

On the one hand, how do you go about proving such an obvious and well-known truism? If you proceed somewhat systematically, you might first begin by getting clear and obtaining agreement about the meaning of any key terms in the dispute. Most important, what does "sunrise" mean? Once the significant terms are defined, then facts can be sought to verify the hypothesis. Let us suppose your friend will reply something along the lines of "sunrise" means "the usual daily movement above the eastern horizon of the star which is the center of our solar system." Second, you might seek to show him that the facts exactly to his definition. That is, while eagerly anticipating his preparing of breakfast, you simply point out the observation that the sun is rising above the horizon, as expected. Finally, you could note that no undue feelings or attitudes have shaped your position on this issue and cloud the judgments and observations of either you or your friend, the other disputant.

On the other hand—let's say you are beginning to be hungry—no telling how long your dim-witted friend will hold out before admitting that he actually does see the sun rising in the sky. O.K., the sun *does* move rather slowly. Why not put the burden of proof on him? Let *him* prove that the sun is not rising. We often take the approach of assuming we are right if our

8. Note the *ad populum*.

beliefs cannot be disproved.[9] Thus, here in the Blue Ridge Mountains you put the question directly to your friend. "What could you possibly mean by saying, 'The sun doesn't rise and isn't rising right now'? Just look!"

Your friend sleepily replies, "Do Kepler and Tycho see the same thing in the east as dawn?"[10]

Alas, you probably remember that Tycho Brahe, as well as most other folks at the time, thought that the earth was the center of the heavens. Kepler was one of the first persons to regard the earth as revolving around the sun. If the earth moves around the sun, then it appears as though your friend is correct. The sun does not really rise, the earth turns. Even worse, he's apparently right when he said the sun has never risen.

Doesn't it seem that by now our culture would have this simple fact entrenched in our ordinary language? We do see the sun rise; we do believe the sun rises. Aren't these facts? Accordingly, both you and your friend do not really have the same visual experience since your conceptual interpretation of what you see differs from what he sees. Even though the patterns of light and color are the similar for you and him, what you experience is largely dependent on the theoretical perspective from which you view the event. Just as we cannot know a foreign language only by listening, so also we cannot know the sun rises only by seeing. It is not at all unusual for two skilled investigators to disagree about their observations, if each is interpreting the the data or "facts of the case" according to different conceptual frameworks.[11] Just as your mind-set affects what you see, so also your awareness of other mental perspectives can affect what you know. The learning of new perspectives is what, in large measure, philosophy is all about.

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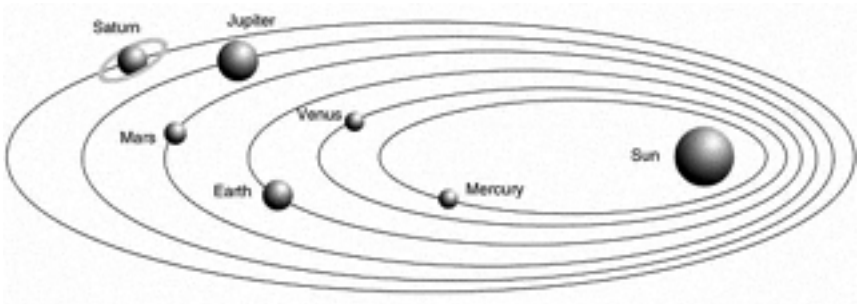
9. Note how this presumption, as well as the friend's original bet could be viewed as an example of an *ad ignorantiam* fallacy. If a statement or a point of view cannot be proved beyond a shadow of doubt, then that statement or point of view cannot be *known* to be mistaken. The *ad ignorantiam* fallacy occurs whenever it is asserted that if no proof of a statement or argument exists, then that statement or argument is incorrect. The error in reasoning is seen when we realize nothing can be validly concluded from the fact that if you can't prove something right now, then the opposite view must be true.
10. For a detailed analysis of this question, see Norwood Russell Hanson's *Patterns of Discovery*, New York: Cambridge University Press, 1958, 5.
11. Frederick Grinnell. *The Scientific Attitude*. Boulder, CO: Westview Press, 1978, 15.

From the reading…

"We find out the specific *relevant* facts by applying a theory in order to determine what facts we think should be considered in our explanation."



Solar System, BNSC © HMG

Related Ideas

Project Gutenberg (http://www.ibiblio.org/gutenberg/etext04). *The Project Gutenberg EBook of Louis Agassiz as a Teacher* A compilation by Lane Cooper of descriptions of Agassiz's teaching methods by several well known former students.

Topics Worth Investigating

1. What is a fact? What are the different kinds of facts? Can we be mistaken about the facts? Do facts change with new discoveries? Are facts discovered or are they constructs of theories?
2. In the *Philosophical Investigations*, Ludwig Wittgenstein indicates the aim of philosophy is "To shew the fly the way out of the fly-

bottle."[12] In what ways is this precisely the same problem facing Samuel Scudder when he sits before *Hæmulon elegans*? What is the difference between finding a method and using a method?

3. If the same state of affairs is seen from two different conceptual frameworks, are there different facts involved? How can facts implied by different theories be compared? Can one structurally "translate" from theory to theory?

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12. Ludwig Wittgenstein. *Philosophical Investigations*. New York: Macmillan, 1953, §309.

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