I must confess I am made anxious by teaching awards, suggesting, as they do, that teaching is an activity that a teacher might develop and cultivate independently of and apart from the mastery of a subject. 1

Good teaching - like sleep - is not easily pursued directly. Think "sleep" and sleep never comes. Take your mind as far away as possible from the very thought of falling asleep, by, say, counting sheep and sleep unexpectedly comes.

Much the same needs to be said of good teaching. It comes, if it comes at all, by focusing elsewhere, as a by-product of pursuing something else. And, more often than not, that something else is, surely, the love of one's subject.
I. Louis Agassiz, Naturalist and Teacher

Some of the mystery of good teaching is illuminated in the following story told by a former student of the great nineteenth century naturalist, Louis Agassiz:

The tale runs that a new student presented himself to Agassiz one day, asking to be set to work. The naturalist took a fish from a jar in which it had been preserved, and laying it before the young student, bade him observe it carefully, and be ready to report on what he had noticed about the fish. There was nothing especially interesting about that fish - it was like many other fish he had seen before. He noticed that it had fins and scales and a mouth and eyes, yes, and a tail. In a half-hour he felt certain that he had observed all about the fish that there was to be perceived. But the naturalist remained away.

Time passed and the young man having nothing else to do began to grow restless and weary. He started out to hunt up the teacher, but he failed to find him, and so he had to return and gaze again at that wearisome fish. Another hour passed and he knew little more about the fish than he did in the first place. He went out to lunch, and when he returned it was still a case of watching the fish. He felt disgusted and wished he had never come to Agassiz, who, it seemed, was a stupid old man after all. Then, in order to kill time, he began to count the scales. This completed, he counted the spines of the fins. Then he began to draw a picture of the fish. In drawing the picture he noticed that the fish had no eyelids. He thus made the discovery as his teacher had expressed it often in lectures, “a pencil is the best of eyes.”

Shortly after Agassiz returned, and after ascertaining what the young man had observed, he left rather disappointed, telling him to keep on looking and maybe he would see something. This put the boy on his mettle, and he began to work with his pencil, putting down little details that had escaped him before, but which now seemed very plain to him. He began to catch the secret of observation. Little by little he brought to light objects of interest about the fish. But this did not satisfy Agassiz, who kept him at work on the same fish for three whole days. At the end of that time the student really knew something about the fish, and better than all, had acquired the "knack" and habit of careful observation . . .

Years later, the student then attained to eminence, wrote, "That was the best zoological lesson I ever had - a lesson whose influence has extended to the details of every subsequent study; a legacy that the teacher left to me, as he left to many others, of inestimable value, which we could not buy, and with which we cannot part." 2

I have often reflected on this story. I suspect that each of us tries to impart to our own students what Agassiz imparted to his, although to say as much in my own case may sound presumptuous. Agassiz’ pupils became known, as the tale makes
plain, for their close powers of observation. I am a teacher of philosophy and philosophers have a reputation, perhaps not totally ill-deserved, for going about with their "heads in the clouds."

II. Absent-Minded Philosophers

The Greek playwright, Aristophanes, helped to solidify the image of the absent-minded philosopher already in the Fifth Century, B.C., when he depicted Socrates descend from the clouds in a basket, deus ex machina, to the great delight of Athenian audiences. And Thales, a pre-Socratic, was noted for regularly falling into wells.

But philosophers are a wily lot. They can fool you. Indeed, Thales, whom many regard as the first Western philosopher, surprised quite a few of his fellow citizens one year by making a fortune on the olive oil market. How could this fellow, who went about with his "head in the clouds," have done so well?

Well, Thales thought a lot about one thing. He thought a lot about water. He believed that of the four elements water was the most fundamental. He would walk through the small town of Meletus where he lived on the Ionian Coast and engage anyone in conversation who cared to stop long enough and demonstrate his belief that water was the most essential of all things. For an example, he would pick up a lime and squeeze it until water came out. He would then gesture towards the lime, look back at his interlocutor, and say "See water is contained in all things." If his interlocutor were clever, he might respond by picking up a nearby stone, squeeze it, and look inquiringly at Thales as if to say "Where is the water to be found in this?" But Thales would reply that his "friend" had perhaps not squeezed hard enough. He would then turn to the sea and point to the ships bobbing on the water to clinch his hypothesis that water was the foundation of all things.

Notice that we already have the ingredients of modern science here: experiment (with a lime) and observation (of boats on the water). In the very beginning it was difficult to distinguish philosophy from physics.

Now because Thales thought a lot about water, he observed that it had rained a considerable amount before harvest time and from this observation he predicted that there would be a bumper crop in olives that year. But everybody laughed at Thales. After all he was always falling into wells. What did he know? Well, he may not have known where he was going, but he did know a lot about water. He snapped up all the available olive presses and made a killing on the olive oil market.

III. Theory and Practice

A striking feature of the Thales story is a practical result came from an apparently pointless activity. I don’t want to defend pointless activities, but basic
research in the sciences is frequently the close observation of processes the immediate consequences of which are not known in advance.

Government organizations rarely understand this and demand of scientists who apply for grants that they anticipate the uses to which their work will be put. Undergraduates are under a similar pressure from the marketplace to acquire knowledge that has immediate practical application. But a real value of the university is it can afford some relief from these pressures. For the next four years of your life you can afford to devote some of your energy to the pursuit of a subject for the sheer love of it, without, hopefully, falling into too many wells, and who knows, as in Thales' case, unexpected benefits may come.

Agassiz taught his students more than a set of facts about fish just as Thales, surely, had more to tell his fellow citizens on the Ionian Coast than to tell them a set of facts about water. Indeed, facts, valuable as they may be, are easily forgotten. You will forget many, if not most, of the facts you learn in the following years, although you have less to worry about memory-loss than your ancestors given the increasingly sophisticated computers and storage devices at our disposal.

In spite of all the facts that Agassiz' student gleaned about fish, he learned something more than that a fish has so many fins and scales. He learned to think about what he was seeing. It is perhaps odd to suppose that being able to think might be a greater asset than knowing this or that fact. Facts, after all, have a certain concreteness; they are the sorts of things you can a grip on and sink your teeth into. Thinking is believed to be the special domain of the philosopher, but philosophy has by no means a monopoly on this mysterious activity as the Agassiz story clearly makes out. Indeed, it is very likely what we all teach in our various fashions. But why do I say that Agassiz taught his student to think rather than simply to look, albeit closely, at a fish?

**IV. Every Way of Seeing is Also a Way of Not Seeing**

When Agassiz’ student first looked - should I say stared? - at that fish, he was not thinking. He did not begin to think until he began to draw the fish with his pencil and in the process saw that there was more to the fish than met his eye, i.e., that it had no eyelids. Whatever changed from the first moment to the second was that, pencil in hand, the student came to stand in a different relation to what he was seeing. At first he looked at the fish and saw it had a tail and fins. He saw what he already knew. Then he began to draw the fish and something changed.

The psychologist Jerome Bruner conducted an experiment, when he was still at Harvard, to see how long it would take a group of subjects to recognize a "red seven of spades" that had been "planted" in an otherwise normal deck of playing cards. Bruner set up a device which could be adjusted to flip through the deck at varying speeds. As the device flipped through the deck and subjects were asked to identify the playing cards they saw. As you can imagine, nearly everyone who
participated in the experiment saw the "red seven of spades" as either a seven of hearts or a seven of diamonds. In other words, they saw what they expected to see. The speed at which the device flipped through the deck had to be reduced to nearly zero before anyone saw the "red seven of spades."

This result should come as little or no surprise. We all have stories, I am sure, from our own lives that can serve as equally good illustrations of this phenomenon. Travelling cross-country, a car filled with sleepy people passes through a small town in the Mid-West. The occupants peer out of the car windows looking for a place to spend the night and as they pass through a town they notice all the "No Vacancy" signs, but they fail to notice how many gas stations are still open. Imagine that this same group of cross-country travelers decide to drive through the night and are passing through that same small town but the gas gauge in the car is low and they are looking for a place to "fill up" rather than looking for a "place to stay." As they pass through the town they notice all the closed gas stations but fail to see the "No Vacancy" signs.

Many of us are aware that expectations shape the way we perceive the world, but we fail to appreciate how pervasive this phenomenon really is. We tend to assume, for example, that advances in the sciences begin with the discovery of new data rather than with a change in our ways of thinking about the world. Indeed, we tend to assume that our ways of thinking about the world change as a result of new observations and that the discovery of new facts forces revisions in theory rather than vice versa. But for this to be so, it would have to be necessary for us to be able to observe new facts apart from the prevalent way of seeing the world. But every way of seeing, no matter how widely shared, is also (simultaneously) a way of not seeing.

Most of you can recall an experiment in Physics I involving a glass rod and pieces of felt: rub the glass rod with a cloth, hold it directly above the pieces of felt, and the felt pieces appeared to leap onto the rod. Then after a time they drop off. When this phenomenon was first observed, nobody noticed that the pieces of felt did not, in fact, fall away, but are, in fact, repelled from the glass rod. This fact was missed because the prevailing way of seeing electricity was to think of it as a charge, a charge that was built up by rubbing the glass rod with a cloth. The pieces of felt were "seen" to fall away because it was assumed that, after a while, the charge wore off. For anyone to see that the pieces of felt did not just fall away but were, in fact, repelled from the glass rod, it was necessary to think of electricity in a new light, as an electromagnetic phenomenon, that could alternate between "plus" and "minus,"

This brief excursus helps to explain the role of the pencil in the hands of Agassiz' student. Odd as it may sound, picking up a pencil and starting to draw, helped the student to take his mind "off" the fish, to bracket his expectations and therein to hold them at bay. Pencil in hand, our "budding" naturalist no longer saw merely what he was predisposed to see. In his hand, the pencil became an "innocent" eye. No longer at the mercy of his expectations, freed from what he was predisposed to think, he went beyond himself. He made a discovery.
V. Having an Idea

When I was an undergraduate, I worried whether I could think at all. I wondered whether I ever had an original idea. Every time I came up with what I thought was an original idea, my enthusiasm would be deflated by a comment from one or another of my teachers to the effect that so-and-so had already said or thought or written exactly what I thought. Such comments were then invariably followed by a list of articles and books to read. No doubt my teachers meant well. They were eager to expand my knowledge. But the net result of their telling me that my ideas had an ancestry only seemed to lead to disappointment and frustration. I was disappointed because all my ideas seemed to be already had by someone else at some earlier point. And I was frustrated because I wanted to have an idea of my own.

My obsession with originality lasted for some time until my father took me to an Annual Meeting of the American Academy of Arts and Sciences. The meeting was held on a large estate in Brookline, Massachusetts. The cultural anthropologist, Clifford Geertz, was to receive the Talcott Parsons Award for outstanding work in the Social Sciences, and, in acceptance of the award, he was going to speak on the "Balinese, Javanese, and Moroccan Conception of Self."

After dinner members of the Academy filed into the East Wing to hear the Geertz lecture. The room was filled with rows of folding chairs and a podium had been placed at the far end. French windows lined one side of the room through which it was still possible, in the remaining light, to see the freshly mowed lawns that surrounded the main buildings. I sat next to my father in the second row. When everyone was seated, the Secretary to the Academy stepped to the podium and read the minutes from the previous meeting. He then asked all members to "please rise" to observe the deaths of those members who had passed away during the course of the previous year. I rose together with my father. The Secretary then began to read the names of the deceased, one after the other.

In public speaking classes students are taught to read terms on a list with an upward inflection until they come to the last term which is then supposed to be read with a downward inflection. So, for example: "apples" (upward inflection), "peaches" (upward inflection), "bananas" (upward inflection), and "grapefruit" (downward inflection). The Secretary, however, read each name with a downward inflection. I thought to myself, "the Secretary is breaking a fundamental rule of public speaking. He is reading each name as if it were the final item on a list." There was, of course, an obvious explanation for the Secretary's violation of the rule. By reading each name with a downward inflection, he communicated to all of us standing in the room that the member whose name he read had passed away. With each downward inflection, the Secretary respectfully laid that member to rest all over again.

I remember at the time wondering if anyone else in the room saw this. I turned around. Members of the Academy were all standing with impassive expressions on their faces. The general demeanor of the members seemed, at the very least, to
be not without some slight degree of irony in light of the fact that the Secretary had asked all members to rise to "observe" the deaths of those members who had passed away and yet, as far as I was able to make out from my quick, not very scientific survey of the room, no one other than myself was observing what the Secretary was doing.

Before I could completely take this in or fully satisfy my curiosity whether I was really the only person in the room to notice that the Secretary was, by the very manner of his speaking, reburying the dead, it suddenly dawned on me. I was having an idea!

Now I should immediately introduce a word of caution at this stage and tell you that, much to my surprise, the experience of "having an idea" was not what I imagined it to be. Heretofore I had thought of ideas as a kind of property. If someone had an idea before I did, if someone got to it first, the idea belonged to him. That idea was taken. If I wished to have an idea of my own, I would have to go on looking.

But when an idea finally came, as it seemed to come at the American Academy of Arts and Sciences some years ago, I seemed to be the occasion rather than the cause of the idea. I had waited for so long to have an idea that I was astonished to find how little my "having" it had to do with me and how much it seemed to have to do with my having been appropriately placed, with my having been in the right place at the right time. Indeed, I hardly seemed to have much to do with it at all, as if it "struck" me rather than I "had" it.

The experience with my father at the American Academy of Arts and Sciences led me to conclude that thinking is largely a matter of attitude. Strike the right attitude and ideas will come. From that day forward I decided that if an idea I had was ever greeted by a teacher's telling me that someone else had had that very idea, I would have the presence of mind to say "Well, now I am having it, too."

In the Agassiz story, the great naturalist places his student in relation to a fish in such a way that a discovery gets made. The pencil and paper are Agassiz' idea. But the discovery that the fish has no eyelids is the student's. Agassiz arranges the world in such a way that the student sees something for himself.

**VI. Thinking and Being Open to the Unexpected**

If there was more to the fish than originally met the student's eye, the act of drawing helped him to see the fish in a new light. Writing can play a similar role in relation to thinking. Too often we understand writing as a way of putting down those thoughts and ideas that we have already had. For many years I understood writing in this way and every time I came to write, I became bored because I already knew what I wanted to say.
But there can be discovery in writing as there can be in drawing a fish with a pencil. Writing can be a way to find out what you think. Jane Austen set her characters going in order to see what they might do and Pushkin, in the midst of composing his long poem, Eugene Onegin, confessed to a friend: "My Tatania has gone off and got married; I never would have expected it of her."

Thinking may be the most precious, albeit the most elusive, quality a university has to offer. It may be a bit outrageous to contemplate having to spend large sums of money for such an intangible result, and the expense may seem even less justified when one recalls that thinking is an activity that one does best by oneself. No doubt you noticed how little Agassiz was around in the tale of his teaching. Still he did arrange things in such a way that some thinking got done. And although it is true that one thinks best when one is alone, if one is truly thinking, one is never lonely. One is lonely, when one misses someone else. But in thinking one need not be lonely because one is in the company of oneself, one is with oneself. Thinking is a solitary, not a lonely business.

But however this mysterious act called "thinking" is characterized, if any of us takes even a small step towards helping to make it possible for you to do it, a university cannot be altogether such a bad place to spend the next four years of your life.

Footnotes

1. A shorter, and somewhat modified, version of this paper was given as an address to the first year students on the occasion of their convocation and in acceptance of the Michael Laban Walzer Award for Excellence in Teaching.