Seventy-first annual Commencement Address given at Stanford University June 17, 1962, by Edwin H. Land, president and director of research, Polaroid Corporation. Text transcribed from a tape recording.

President Sterling, Graduating Class, Friends:

I find myself peculiarly interested in this moment in the life of this graduating class because it is ordinarily assumed that this is a fresh beginning for a creative life that the years of preparation have now made you ready to go ahead with the extremely difficult problems, and the fascinating problems, in the world around us.

But if one looks around at other classes of other generations one must admit that the yield from here on is low, that the yield in terms of good citizens is high, that the yield in terms of good parents and good teachers is high.

But the yield in terms of people who are ready to undertake the special problems of the generation in art and science and literature, that yield is very low indeed. And so we must say statistically that unless during the time that it takes to make an egg hard-boiled, namely ten minutes - which is while I shall be speaking to you - unless during those ten minutes the course of your life is altered then this class too will make wholesome, happy, hearty American boys and girls, men and women, grandfathers and grandmothers, but the world will go on in its lethargic and unpredictable way.

Now that is what I should like to change and I should like in the next ten minutes to make that change. Now join with me in this analysis.

We assume that democracies, as opposed to dictatorships, leave us free to use our minds, since the techniques of open political controversy prevents the government becoming excessively involved in thought-control.

Today I should like to examine the hypothesis that in spite of the fact that we live in an open society politically we are nevertheless not free to use our minds because of cultural patterns, because of misconceptions of what education can do, and because of our primitive ignorance about the mechanism involved in the use of the mind for the rather novel purpose of thinking.

I shall try to show that the use of the mind for the purpose of thinking does not imply the rejection of our cultural patterns, of the greatness within the traditions that reach back to pre-history. On the contrary, I shall urge that the base of operations for a thinking person is a secure and comfortable emotional aesthetic association with everything human that has ever been.

I would argue that while accepting the idea of the evolution of nobility we must recognize that we cannot understand nobility without an almost indulgent appreciation of the nature
of the farflung corruption, mediocrity, and evil from which nobility arises.

Thus in the last analysis we must accept our past in its totality. To reject a portion of it is to become involved with that portion. Each of us is all the evil and all the good that ever was, and all the ugliness and all the beauty. Insofar as we are less than this, we are diminished. Insofar as we can know the past in its totality and insofar as we can accept it as the essence of our being, thus far we are prepared for the fresh start and special contribution to be made by each of us. Apparently then, the rejection of components of a part is not the easy road for the use of the mind for thinking.

Higher education is subject to incessant attack because of the misconceptions that the pupil should learn to think creatively as a consequence of being educated. Of course pragmatically and statistically it is self-evident to everybody that the ability to think creatively is not a consequence of being subjected to the educational process. The common error is to consider the process as a failure in general except for the handful of bright pupils but to accept the system as the best that we know how to operate.

If we take, however, the view which I am suggesting, namely that the role of education is not to teach people how to think creatively but rather to acquaint them as fully as possible with the totality of the past, then the potential of the educational system becomes much higher. It seems possible that if this role was accepted honestly then our schools might address themselves to this task with vigor and effectiveness.

By dissecting out of the wonderful, life-long process of acquiring intimacy with the total past, by dissecting the art of thinking creatively out of that, we free ourselves to turn our attention to the question of how to make the mind think in the generative way.

But you say - Are not all these studies in history, philosophy and science more than cultural acquisitions? When our pupils learn that somebody taught such and such and then was proved wrong by somebody else, is that not teaching our pupils to think? Or, when we attempt to demonstrate that history shows there are many sides to a question; or, that the argument is resolved by an Hegelian synthesis or that it is not; or, when we show the evolution of modern physics from Plutonian physics, are we not in all this teaching our pupils to think creatively? We should not be embarrassed by having to say "Well, no, not really," just as we are not teaching them to play the piano, or to paint, or to dance, or to love, or to cook, so we are not teaching them the highest of the arts: how to use the individual mind in the creative way for the special problems before that mind.

Most discussions and most analyses, whether they be in history, literature or science, are making use of the mind for the vital social purpose of acquiring intimacy with the behavior and the achievements of others. Without this intimacy the past would seem hollow, the present would seem futile, and the future would seem terrifying.
We want more and not less of education so conceived and yet we must recognize that education so conceived although preparing each of us to begin a separate life rooted in and embracing the total past, gives life no purpose beyond that which each of us in his inevitable loneliness generates for himself.

Furthermore, the view which we have all held leads us to the delusion that the educated person has been prepared to use the mind for new thinking and that, therefore, all he has to do to make a significant individual contribution is to continue to think in his newly chosen field with the same techniques he used while becoming intimate with the past. Since I regard this as the major error of our culture, an error carried into later life by all of us in all fields, I should like from here on to discuss the structure of this error.

It happens to be my conviction that within every healthy individual - within every healthy individual - there abides the ability for creative and constructive activity. That this ability is called upon in only one out of a few million people is a matter of indifference to Nature.

One of our great East Coast delicacies is the roe of the Delaware Shad, sauté meunière. It is impossible to make a meal of these thousands of little eggs without noting Nature's carelessness and wondering about all the little shads that never came into being. For millions of years human bodies have carried in them the outstanding miracle of all the ages of the past and of the future - the human mind - and these minds have, like the shad roe, been scattered unused and wasted by Nature in her indifferent profligacy. It is important for us not to draw the conclusion that because this abundancy of mind is wasted that therefore most minds are not useful; each little shad egg could have become a fine fish.

Now the product of the poor part of our educational system, primary and secondary schools in many places, some colleges, is a populace deprived of the richness of the past and therefore cut off forever from full effectiveness. The product of the best part of our educational system is the few tens of thousands of people who have been endowed with the knowledge of the past insofar as it is available and understandable.

This knowledge, however, must be highly ritualistic since no way has been found to educate even a hundred thousand select pupils except by organizing the contents of an education. Thus the mediocre student will know the views about Hamlet held by a scholar on the East Coast or on the West Coast; a good student will know the views of the two opposing scholars on the two coasts; and the brilliant student will correlate the two views with a touch of Freud thrown in.

What is required of the student is monumental industriousness and flexibility in the assimilation and filing of a vast array of attitudes of others towards the totality of history, in science, in politics and in art. I predict that within the next twenty-five years much better ways will be discovered within our universities for
relating the emerging individual with the totality of his culture. But for the time being we must accept and be grateful for what we now have in our best universities.

But we must not forget that the product of higher education is a person with only a great past and without the technique for creating a great future. It is only natural to emerge from this first stage of training with a taste for the comforts of group living, for the comforts of group thinking, as if such a thing as group thinking ever existed. I submit that it does not. While there are, of course, rare gatherings of very great men at which a science be redirected, most controversies, most discussions, most analyses, have to be stated as polar opposites and all of our knowledge of the past does not keep us from treating most of the situations in the present by simply taking sides.

Now I urge that once a group of people have taken one side or the other in a controversial situation then the mind except as a political tool is no longer used creatively. Indeed I would go so far as to say that seeing both sides of an argument or even admitting that it is not all black and white but that there are greys in between is an utterly inadequate approach to most established controversies.

I would urge that the mind ceases to be a creative tool but becomes a social instrument for the fun and excitement of joining one's friends and opposing one's enemies. Thus most controversies might be said to exist along an axis like the abscissa in a rectangular coordinate system, and all the arguments, discussions and compromises go on along that axis never to be resolved. And then historically some great tide of history - the change in the nature of trade in Venice, invasion from the North by the Huns - some great tide of history alters the whole situation and the controversy is resolved not along the axis but by a group of phenomena all of which are entirely unrelated to the original structure of the controversy.

Now, when I think - when we think together now - of that phase of the magnificent human mind, of the Babylonian slave, all the minds running back to the beginning of human-kind, all being wasted, yours about to be, it seems worth while to take two or three moments to say: Is there a way in which we as individuals can do what history does to end the Thirty Years War? Can we do what history does? Can we as individuals take on activities at right angles to the axis of controversy?

Orthogonal is the mathematical term. And now mathematically what that means is that whatever happens, whatever you do, on that orthogonal axis, the axis at right angles to the angle of controversy, has no projected effects on the axis of controversy.

You are not involved with either side; you find the way of solving the problem without having a luxurious emotional privilege of being at the one end loving your associates and hating the people at the other end. As you go on to your orthogonal solution, your special way of solving the problem that does not involve either end of the axis, you find yourself a lonely person because it is hard to
say what is worse - not to have friends or not to have enemies. As an orthogonalist, you have neither. You have looked the situation over; you have brought your full knowledge of the past, which has now been assimilated within you, to bear on the problem, you turn to your unconscious, you pray to your God, and somehow out of all that, you see a new way, quietly and without argument.

As soon as you argue you are involved. As soon as you argue with either end of the axis, you are on the axis and you are one of them, and you sacrifice the solution of the problem and the use of your mind to the sporting activity of conflict.

Now look around, do we test or don't we test; do we Berlin or don't we Berlin; do we co-ed or don't we co-ed. Name any of these problems and what you'll find is the material for a delightful cocktail conversation. It goes on and on and it has gone on and on and it will go on and on, and you know in your heart that no matter how long it goes on there will be no resolution along the exhausted intellectual axis which many people have explored. If either side is obvious, and in a two-sided situation both sides are obvious, then any solution that could exist would long since have been found.

So, I look at you and I know - I just know - that every one of you is a nearly divine product. In every one of you there exists a mind so miraculous that nothing whatsoever that exists in science today, absolutely nothing whatsoever, nothing in information theory, computer theory, solid state theory, nothing in aesthetics, nothing in religion, nothing gives us the slightest clue to the total miracle of the mind that is within each and every one of you.

You have got the task started now, it will take all your life to keep assimilating it. Now you have the choice from now on of using that mind in the empty way of joining groups and taking sides --- now don't misunderstand me, I am not referring to situations where there are obvious and manifest injustice, I am not talking about a situation where there is murder of a group or destruction where it gets obvious that a brave person must take sides --- I am not referring to those situations.

I am referring to all the political and scientific and literary situations in which endless discussion along the same axis has taken us nowhere and I say to you, I pray to you - stop - don't use the techniques which have brought you this far except for further acquisition of insight into the past but - stop - and say I will not indulge in arrogant modesty, I will not say that because it is I nothing great or important or significant can come, I will not say that I am so important that Nature has selected me to be unimportant, rather I will say I am the inheritor of a noble tradition, of a nobility worked out by a race that has known sin incessantly but which nevertheless rises above it.

And on my own, in my very special way, and I am special --- my finger-prints are different from everybody else --- in my special way, I will find problems that need solving and I will bring my body and my soul and my mind to their solution.