
THOMAS HENRY HUXLEY

*From A Liberal Education*¹

[*A Game of Chess*]

Suppose it were perfectly certain that the life and fortune of every one of us would, one day or other, depend upon his winning or losing a game of chess. Don't you think that we should all consider it to be a primary duty to learn at least the names and the moves of the pieces; to have a notion of a gambit,² and a keen eye for all the means of giving and getting out of check? Do you not think that we should look with a disapprobation amounting to scorn, upon the father who allowed his son, or the state which allowed its members, to grow up without knowing a pawn from a knight?

Yet it is a very plain and elementary truth that the life, the fortune, and the happiness of every one of us, and, more or less, of those who are connected with us, do depend upon our knowing something of the rules of a game infinitely more difficult and complicated than chess. It is a game which has been played for untold ages, every man and woman of us being one of the two players in a game of his or her own. The chessboard is the world, the pieces are the phenomena of the universe, the rules of the game are what we call the laws of Nature. The player on the other side is hidden from us. We know that his play is always fair, just, and patient. But also we know, to our cost, that he never overlooks a mistake, or makes the smallest allowance for ignorance. To the man who plays well, the highest stakes are paid, with that sort of overflowing generosity with which the strong shows delight in strength. And one who plays ill is checkmated—without haste, but without remorse.

My metaphor will remind some of you of the famous picture in which Retzsch³ has depicted Satan playing at chess with man for his soul. Substitute for the mocking fiend in that picture a calm, strong angel who is playing for love, as we say, and would rather lose than win—and I should accept it as an image of human life.

Well, what I mean by Education is learning the rules of this mighty game. In other words, education is the instruction of the intellect in the laws of Nature, under which name I include not merely things and their forces, but men and their ways; and the fashioning of the affections and of the will into an earnest and loving desire to move in harmony with those laws. For me, education means neither more nor less than this. Anything which professes to call itself education must be tried by this standard, and if it fails to stand the test, I will not call it education, whatever may be the force of authority, or of numbers, upon the other side.

It is important to remember that, in strictness, there is no such thing as an uneducated man. Take an extreme case. Suppose that an adult man, in the full vigor of his faculties, could be suddenly placed in the world, as Adam is said to

1. Originally an address, delivered at the South London Working Men's College in 1868.

2. An opening move in chess in which a pawn or other pieces are sacrificed in order to gain a favorable

position.

3. Friedrich A. M. Retzsch (1779–1857), German painter.

have been, and then left to do as he best might. How long would he be left uneducated? Not five minutes. Nature would begin to teach him, through the eye, the ear, the touch, the properties of objects. Pain and pleasure would be at his elbow telling him to do this and avoid that; and by slow degrees the man would receive an education which, if narrow, would be thorough, real, and adequate to his circumstances, though there would be no extras and very few accomplishments.

And if to this solitary man entered a second Adam or, better still, an Eve, a new and greater world, that of social and moral phenomena, would be revealed. Joys and woes, compared with which all others might seem but faint shadows, would spring from the new relations. Happiness and sorrow would take the place of the coarser monitors, pleasure and pain; but conduct would still be shaped by the observation of the natural consequences of actions; or, in other words, by the laws of the nature of man.

To every one of us the world was once as fresh and new as to Adam. And then, long before we were susceptible of any other mode of instruction, Nature took us in hand, and every minute of waking life brought its educational influence, shaping our actions into rough accordance with Nature's laws, so that we might not be ended untimely by too gross disobedience. Nor should I speak of this process of education as past for anyone, be he as old as he may. For every man the world is as fresh as it was at the first day, and as full of untold novelties for him who has the eyes to see them. And Nature is still continuing her patient education of us in that great university, the universe, of which we are all members—Nature having no Test Acts.⁴

Those who take honors in Nature's university, who learn the laws which govern men and things and obey them, are the really great and successful men in this world. The great mass of mankind are the "Poll,"⁵ who pick up just enough to get through without much discredit. Those who won't learn at all are plucked;⁶ and then you can't come up again. Nature's pluck means extermination.

Thus the question of compulsory education is settled so far as Nature is concerned. Her bill on that question was framed and passed long ago. But, like all compulsory legislation, that of Nature is harsh and wasteful in its operation. Ignorance is visited as sharply as willful disobedience—incapacity meets with the same punishment as crime. Nature's discipline is not even a word and a blow, and the blow first; but the blow without the word. It is left to you to find out why your ears are boxed.

The object of what we commonly call education—that education in which man intervenes and which I shall distinguish as artificial education—is to make good these defects in Nature's methods; to prepare the child to receive Nature's education, neither incapably nor ignorantly, nor with willful disobedience; and to understand the preliminary symptoms of her pleasure, without waiting for the box on the ear. In short, all artificial education ought to be an anticipation of natural education. And a liberal education is an artificial education which has not only prepared a man to escape the great evils of disobedience to natural laws, but has trained him to appreciate and to seize upon the rewards which Nature scatters with as free a hand as her penalties.

4. Legislation (repealed in 1854) which excluded from Oxford and Cambridge any student who would not profess faith in the 39 Articles of the Church of England.

5. English slang term describing the mass of students who get through college with very low (but passing) grades.

6. Failed.

That man, I think, has had a liberal education who has been so trained in youth that his body is the ready servant of his will, and does with ease and pleasure all the work that, as a mechanism, it is capable of; whose intellect is a clear, cold, logic engine, with all its parts of equal strength, and in smooth working order; ready, like a steam engine, to be turned to any kind of work, and spin the gossamers as well as forge the anchors of the mind; whose mind is stored with a knowledge of the great and fundamental truths of Nature and of the laws of her operations; one who, no stunted ascetic, is full of life and fire, but whose passions are trained to come to heel by a vigorous will, the servant of a tender conscience; who has learned to love all beauty, whether of Nature or of art, to hate all vileness, and to respect others as himself.

Such a one and no other, I conceive, has had a liberal education; for he is, as completely as a man can be, in harmony with Nature. He will make the best of her, and she of him. They will get on together rarely; she as his ever beneficent mother; he as her mouthpiece, her conscious self, her minister and interpreter. * * *

1868, 1870

*From An Address on University Education*¹

[The Function of a Professor]

Up to this point I have considered only the teaching aspect of your great foundation, that function of the university in virtue of which it plays the part of a reservoir of ascertained truth, so far as our symbols can ever interpret nature. All can learn; all can drink of this lake. It is given to few to add to the store of knowledge, to strike new springs of thought, or to shape new forms of beauty. But so sure as it is that men live not by bread, but by ideas, so sure is it that the future of the world lies in the hands of those who are able to carry the interpretation of nature a step further than their predecessors; so certain is it that the highest function of a university is to seek out those men, cherish them, and give their ability to serve their kind full play.

I rejoice to observe that the encouragement of research occupies so prominent a place in your official documents, and in the wise and liberal inaugural address of your president. This subject of the encouragement, or, as it is sometimes called, the endowment of research, has of late years greatly exercised the minds of men in England. It was one of the main topics of discussion by the members of the Royal Commission of whom I was one, and who not long since issued their report, after five years' labor. Many seem to think that this question is mainly one of money; that you can go into the market and buy research, and that supply will follow demand, as in the ordinary course of commerce. This view does not commend itself to my mind. I know of no more difficult practical problem than the discovery of a method of encouraging and supporting the original investigator without opening the door to nepotism and jobbery. My own conviction is admirably summed up in the passage of your president's address, "that the best investigators are

1. During a visit to the United States in 1876 Huxley delivered an address in Baltimore on the occasion of the founding of the Johns Hopkins

University, a newly endowed institution which encouraged research.

usually those who have also the responsibilities of instruction, gaining thus the incitement of colleagues, the encouragement of pupils, and the observation of the public." * * *

It appears to me that what I have ventured to lay down as the principles which should govern the relations of a university to education in general, are entirely in accordance with the measures you have adopted. You have set no restrictions upon access to the instruction you propose to give; you have provided that such instruction, either as given by the university or by associated institutions, should cover the field of human intellectual activity. You have recognized the importance of encouraging research. You propose to provide means by which young men, who may be full of zeal for a literary or for a scientific career, but who also may have mistaken aspiration for inspiration, may bring their capacities to a test, and give their powers a fair trial. If such a one fail, his endowment terminates and there is no harm done. If he succeed, you may give power of flight to the genius of a Davy or a Faraday,² a Carlyle or a Locke, whose influence on the future of his fellow men shall be absolutely incalculable.

You have enunciated the principle that "the glory of the university should rest upon the character of the teachers and scholars, and not upon their numbers of buildings constructed for their use." And I look upon it as an essential and most important feature of your plan that the income of the professors and teachers shall be independent of the number of students whom they can attract. In this way you provide against the danger, patent elsewhere, of finding attempts at improvement obstructed by vested interests; and, in the department of medical education especially, you are free of the temptation to set loose upon the world men utterly incompetent to perform the serious and responsible duties of their profession.

1876–77

2. Sir Humphry Davy (1778–1829), English chemist and inventor; Michael Faraday (1791–1867), at one time Davy's laboratory assistant, who

became famous for his discovery of the induction of electric currents.