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Speech by Dr. G. Herzberg on the occasion of his Installation as Chancellor of Carleton University,

Ottawa, 2 November 1973

Mr. President, Members of Convocation, Distinguished Guests:

My first and most agreeable duty is to say how greatly I am honoured by the action of the Board of Governors in electing me Chancellor of Carleton University. To follow in the steps of two such great Canadians as the late "Mike" Pearson and my old friend and mentor C.J. Mackenzie is a high honour indeed. I would also like to express my deep appreciation to the many friends and colleagues from other Canadian universities who are honouring this occasion by their presence and to Sister Wallace and Dr. Parr for the kind words of congratulation.

When I came to Ottawa in 1948 Carleton was still Carleton College, an evening college founded by another great Canadian, the late H.M. Tory. During the intervening years I have had the opportunity to watch Carleton's development at fairly close range. From a very small college it has developed into a university of medium size which is well-regarded in Canada and whose reputation in some fields has passed beyond the borders of this country. It appears to me that its present size is just about ideal to achieve the main aim of a university which is, according to Robert Hutchins, to be a community of scholars.

I was present a few years ago at the installation of the Chancellor of another Canadian university. In the introduction of the new Chancellor it was pointed out to him that his new office did not entitle him in any way to direct or influence the educational policy of the University. Although this matter has not been stated quite so directly in these proceedings it is nevertheless very clear to me that my new office is almost entirely ceremonial, and that the responsibility for running the University rests almost wholly with the <u>Vice</u>-Chancellor, i.e., the President. Indeed had it not been so I would hardly have accepted this position, since I do not consider myself qualified to take the responsibility for the successful operation of a university.

Therefore when I make a few suggestions in this address I hope that you will realize that they are not well thought-out plans of an experienced educator and that the administration of this University need not even consider them in any of their long-range planning.

The points I would like to discuss briefly in their relation to university policy are, firstly, the problem of the two cultures and, secondly, the problem of encouraging excellence in a democratic society.

Long before C.P. Snow published his well-known

little book "The Two Cultures and the Scientific Revolution" (based on the Rede Lecture at Cambridge, 1959) most scientists and humanists were aware of the difficulty of communication between members of the two groups. But C.P. Snow posed the problem far more eloquently than had been done before.

As he stated it: "Literary intellectuals at one pole - at the other scientists, and as the most representative, the physical scientists. Between the two a gulf of mutual incomprehension - sometimes (particularly among the young) hostility and dislike but most of all lack of understanding. They have a curious distorted image of each other. Their attitudes are so different that, even on the level of emotion, they can't find much common ground".

Snow later qualified this subdivision into two cultures by emphasizing that it represents a great simplification since actually there are, of course, many more than just two cultures - law, politics, sociology, engineering, medicine, etc., - but for the present discussion Snow's simplified version will do.

Most scientists have found in their non-scientist friends a lack of understanding of even the most elementary concepts of scientific thought and I am sure humanists have had a corresponding experience in their relations with scientists. This "gulf of mutual

incomprehension" is clearly undesirable since both the scientist and the humanist pursue their studies with the same aim of achieving a better understanding of man and his world - the scientist by his efforts to interpret the physical world and the humanist by creative works that try to understand the human mind.

There is, of course, a fundamental difference between scientific and humanistic knowledge. This difference becomes particularly apparent when we look at the relations of each group to the great masters of the past. To understand mechanics or astronomy it is not necessary to read Newton in the original, to understand present-day nuclear physics it is not necessary to read the original papers of Rutherford, one of its great pioneers. Once a scientific discovery has been made it ceases to be personal to the discoverer and becomes part of the universal body of scientific knowledge. Except for historical reasons, the original papers are quickly superseded by superior accounts that are rapidly provided by teaching experience and didactic skills. But the writings of a great critic or historian - and even more those of poets and other artistic creators are part of their own message and to paraphrase the argument would be to destroy the effect. Knowledge and insight here are private and personal and the message can be obtained only by constant reference to the

original work.

In spite of this fundamental difference in their attitude to the past there is no intrinsic reason why a scientist should not have some knowledge and appreciation of art, literature and music, or why a humanist (or lawyer or politician) should not have some knowledge and appreciation of science and mathematics. The lack of understanding between scientists and non-scientists is positively dangerous at a time when the applications of science determine more and more of our lives, when indeed the survival of the human race is dependent on our ability to apply our scientific knowledge to overcome the undesirable effects of technology (pollution, overpopulation, etc.) and to remove the great disparity in the standard of living between the developed and developing countries.

Most of our politicians are lawyers, very few are scientists. Even though they are increasingly faced with important decisions on questions that involve complex technological considerations (and have to explain them to their constituents) they do not have the scientific training necessary to assess properly all the implications of some of their decisions. It is a very basic and important matter which cannot easily or quickly be remedied. I believe that one of the reasons for this lack of understanding is that in our present educational .5.

system we try to give every young student the freedom to take whichever subject attracts him. To some pedagogues that sounds very desirable and democratic but it does lead to the consequence that a majority of students leave high school without any serious training in or understanding of science. It seems to me that this is a freedom that we can ill afford at a time when our survival may depend on the scientific knowledge of our public servants and our politicians. But even apart from this danger (which did not exist say fifty years ago) each of us, scientist or non-scientist, would find some knowledge of the other field enlightening and useful in his own field.

A few weeks ago I came across a recent statement by Arnold Toynbee which is relevant to this discussion. He said: "I myself have always deliberately aimed at being a 'generalist', and I have been criticized for taking this line. I have taken for my field the study of human affairs, seen on the move through time. But human affairs are only one facet of the Universe. Looking back, I now regret that, at the age of sixteen, at school, I was allowed to choose between starting on calculus and giving up mathematics altogether in order to spend the whole of my working time on reading more widely in the Greek and Latin classics. I ought not to have been given this choice at that age. I chose

wrong, and consequently the field of mathematics, and of the branches of science founded on mathematics, has been closed to me".

As an example of the opposite type J may perhaps mention my own experience. I was brought up in a school (gymnasium) in which such freedom of choice did not exist. At that period of my life I resented very much the time and effort which I had to spend on writing essays on literary subjects, on history and similar topics, and would have preferred to spend all my time on science and mathematics. In retrospect, however, I feel grateful to a system that did not give me the freedom to avoid literary subjects. Quite apart from the widening of my horizon the need for writing essays was an extremely important preparation for writing scientific papers and scientific books (and speeches like this one).

The example of Arnold Toynbee shows that fifteen or sixteen-year olds are in general not able to make the best decision for the future and must be given wise guidance. Perhaps the universities should press for less choice in the high school curriculum to ensure that students, even those who want to study the humanities or the social sciences, have a good grounding in mathematics and the natural sciences. If this cannot be done directly the universities could exert great influence by making basic knowledge in both scientific and non-scientific

subjects a requirement for entrance.

I should now like to turn to the second subject of my talk, the problem of excellence in a democratic society. It appears to me that one of the important tasks of a university teacher is to instil into his students an appreciation of excellence, to train them how to distinguish superior from imferior work, whether it be in the humanities or the sciences, to inspire them to strive for excellence in all their studies. 8.

When we compare our own work with that of great thinkers or artists we realize the enormous range of the concept of excellence. Such a comparison teaches us humility and modesty. In each generation there are in all fields perhaps 1000, possibly 10,000 individuals of truly great excellence who, through their work, greatly influence the spiritual future of mankind. It seems almost like a platitude to suggest that we should emulate these exceptional individuals and that our society should do all in its power to foster the development of such individuals.

In the last two centuries we have seen in most countries steady progress toward the abolition of privilege, that is, toward a class-less society; in other words, we have witnessed the development of real democracy. In the struggle for social equality the necessity to maintain excellence in intellectual matters has often been ignored. Indeed, in a strictly egalitarian society excellence presents an awkward and embarrassing problem.

Even though it is perfectly obvious that men are not born with equal intellectual gifts there are political groups which seem to believe that excellence of a few is somehow undemocratic and should therefore not be encouraged (except, of course, insofar as it serves the purpose's of the group). For example, it appears that in present-day China excellence is not emphasized. As a result there are very few writers of any consequence in China whose work has received world-wide recognition. Nor have any significant scientific discoveries been made in China during the last thirty years. Of course, the small fraction of highly gifted people is surely very nearly the same in China as in other countries, but apparently they are not encouraged to develop their talents. Indeed, fifteen years ago two bright young Chinese physicists who left their home country and went to the U.S.A. made an extremely important discovery (non-conservation of parity) for which they were awarded the Nobel Prize in 1957. It is most unlikely that they would have made this discovery had they remained in China.

As another example of the difficulties that one encounters in pursuing excellence I should like to

mention the recent attacks on Professor Herrnstein of Harvard University, who in an article in the Atlantic Monthly had restated the generally accepted result of I.Q. tests (particularly of identical twins) that intelligence is 80% inherited, and had drawn the conclusion that "social standing will be based to some extent on inherited differences among people". Several leftist student groups considered him therefore an "elitist" or even racist and fascist.

Suppose for a moment that the great geniuses of the past, Shakespeare, Goethe, Leonardo da Vinci, Rembrandt, Mozart, Beethoven, Schubert, Newton, Einstein, etc., etc. had not lived or had been suppressed by an egalitarian movement. Would that not have taken away the major justification for the existence of mankind? Aren't the supreme moments of the human race those in which a man of genius creates a work of art of eternal beauty or recognizes a law of nature or of thought that contributes in a significant way to our understanding of the universe we live in?

Of course, creative men of genius cannot live on their own. For one thing the human race must survive so that these men of genius can arise, and many able men and women are needed to ensure survival physicians, politicians, engineers, etc. But let no one tell us that survival and the improvement of the

standard of living is to be the principal aim of society. Rather, let us develop a cultural climate which believes that human excellence is a good thing in itself, a climate in which all members of society can rejoice and delight in the things that the small number of exceptional members is able to do without asking what use they have for survival. We must come to the point where even the average citizen considers the works of art, literature and basic science as not merely the icing on a cake but as the essence of human existence. Without that, to quote C.P. Snow again, "some of the major hopes, the major glories of the human race will rapidly disappear".

It is at the universities where much of the creative work of men of genius has been done and appreciated. For the future we must look to the universities, to this university, to maintain and improve the high standards of the past, to recognize, to preserve for posterity and to interpret works of genius wherever they are found, to encourage excellence of all degrees in its students and faculty members, not to give in to any tendency that, for the sake of egalitarianism, tries to belittle the striving for excellence.

From the point of view that I have presented the striving for excellence in order to increase our cultural heritage is the most important aim of humanity.

There may be more urgent things to be done in connection with our survival. But it is fortunate that success in our attempt to survive depends just as much on excellence in all our intellectual endeavours as does the striving for knowledge for its own sake, for the understanding of man and his world.

May Carleton University never waver in the pursuit of excellence.