THE ROLE OF THE UNIVERSITIES

IN FACE OF THE MATERIAL AND MORAL CHANGES BROUGHT ABOUT IN CONTEMPORARY SOCIETY BY SCIENTIFIC AND TECHNOLOGICAL PROGRESS

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in face of the material and moral changes brought about in contemporary society by scientific and technological progress

Function of the University

The provision of higher intellectual and technical education is not the sole task of the University. The furtherance, co-ordination and dissemination of our store of knowledge are also centred in it.

Its chief functions are :

1) To make new discoveries and develop old ones through continuous scientific research;

2) To disseminate these discoveries through education ;

3) To safeguard our cultural heritage, ensure its continuity, and defend it against all irrational or dogmatic forces ;

4) To train professional cadres to meet each country's present and future needs ;

5) To foster among its members and students the love of culture, the sense of the freedom and dignity of the individual, and respect for others.

Most new discoveries are made and firmly established through scientific research at Universities. Research is the University's primary function, chronologically and hierarchically, for disco-

veries must be made before they can be taught. An institution which does not carry out fundamental research does not deserve the name of University, although it may provide a reasonably good training for a profession. Conversely technical colleges which carry out fundamental research belong in fact to the category of Universities.

In all countries the University passes through three main stages. At the first stage, as in the more backward countries, no University exists and professional cadres must be trained abroad. Next come countries whose institutions train specialized professional, technical and administrative personnel but do not carry out fundamental research. At the highest stage the Universities contribute to the advancement of science and thereby obtain better teachers and better professional cadres. The advance of modern science inside and outside the Universities is characterized by growing recognition of the importance of research and by efforts to improve the material conditions under which it is carried out.

Education must not be a mere transmission of acquired knowledge, but must above all aim at training students to extend their culture throughout their lives, for our store of knowledge is continually growing and being modified. University education must foster initiative, sound judgment, and the ability to solve new problems.

University teachers must be selected for the value and originality of the discoveries they have made and the quality of the pupils they have trained, but they must also possess a love for teaching, a desire to bring out students' true vocations, and finally organizing ability. They should not be appointed merely for their eloquence.

The activity of a University must be threefold—intellectual, technical and ethical. It must teach its students to think independently and correctly, and to express themselves in clear, precise and logical fashion. Its products must be conspicuous for their culture, ability, initiative, character and behaviour.

Although ethical principles vary to some extent from one country to another, some of them are fundamental and form the

basis of all university education ; these are love of truth, tolerance and intellectual freedom, mankind's supreme achievements, the sense of duty towards society, and a true democratic spirit, which, being based on justice, enable the individual to attain his legitimate aspirations, particularly when these contribute towards improving the ethical, intellectual and material welfare of others.

University education must assert the dignity of the individual and the sense of responsibility, and train men capable of initiative, conscious self-discipline, respect for right and justice, and solidarity with mankind.

The rôle of science

One of the most characteristic phenomena of present-day civilization is the daily increasing part played by science and its applications. It has been said that we live in a scientific era. It is true that the power and wealth of a country and even its independence largely depend on the state of its science. The enormous power that scientific inventions can give has aroused the interest of governments and large-scale industry, which often allocate substantial sums to research. Unfortunately those who provide this assistance frequently seek to utilize science for political or economic ends and not for the welfare of mankind in general. In this way science, though acquiring considerable sums, risks losing its freedom.

It is regrettable that politicians are almost entirely ignorant of the meaning of science. Scientists, for their part, generally refuse to concern themselves with politics, which they consider as an inferior activity liable to distract them from their work. Moreover they are not equally well-informed on all branches of science and are not, generally speaking, familiar with administrative, political or social problems.

It would be desirable for governments to consult competent scientists and learned bodies on all matters of scientific interest. In turn scientists, learned bodies, and especially Universities should inform governments, teachers and the population at large of the principles, methods and great discoveries of science. The newspapers could also play a leading rôle, particularly if they strictly

followed the principle of always preferring truth and avoiding any kind of sensationalism. In secondary and even primary education a brief but clear outline could be given of the rôle of science and the importance of scientific research.

Science is kept alive by continual fundamental research, the source from which all technical applications flow. The strength and progress of a country or University and its place in the modern civilized world can be measured by the importance accorded to fundamental scientific research and the concrete assistance provided for it.

Scientific research may be defined as an incessant examination of problems with no other end in view than the demonstration of truth, independently of religious, political or any other dogma. To achieve this, freedom of research, expression and discussion is necessary. Science develops satisfactorily only in an atmosphere of liberty, and languishes or declines under oppressive régimes. All too frequently dictatorial régimes fail to respect scientists' individual or academic freedom.

Science arises from the need for knowledge which characterizes man as a rational being. It modifies the conception of the world and of man, and accustoms the latter to clearer reasoning and clearer demonstration. In stressing the difficulty of attaining truth, science accustoms mankind to exact demonstration, freedom of discussion and tolerance.

Science and its applications have played an immense rôle in social progress. Hygiene, medicine and the science of nutrition have revolutionized men's lives. Pestilential epidemics belong to the past, and most infections can now be cured. People live longer and healthier lives. The achievements of surgery are increasingly audacious and remarkable.

The utilization of natural supplies of energy has liberated mankind from slavery and forced labour and enabled great output to be obtained with less work. Improvements in agriculture and industry enable the world's growing population to be fed. All this is the result of technical inventions which themselves derive from fundamental scientific research.

The development of communications has permitted food sup-

plies and the material conditions of life to be improved. But its main advantage is that it has enabled scientific knowledge and the masterpieces of thought and art to be exchanged and disseminated throughout the world. In this way the development of communications has contributed to raising the cultural level of mankind.

Until recent years it was thought that science was always beneficent and invariably served the cause of progress and human welfare. Today, as a result of the part played by science during the war, and particularly since the atom bomb, it is realized that science may be used to oppress, destroy or kill.

The function of science must therefore be made clear in ethical terms. The progress enjoyed by mankind does not depend, as is erroneously believed, on ephemeral and variable political decisions, but on the discovery of scientific truths and their applications, when the latter are guided by sound ethical principles.

Scientific discoveries must exclusively serve to improve the material and spiritual welfare of mankind. They must rapidly conduce to the benefit of the greatest possible number of human beings. The less advanced peoples must be helped to improve their methods and increase their resources. Efforts must be made to develop fraternity and scientific and cultural co-operation among the peoples of the entire world.

In recent years we have been horrified to see scientific discoveries used for oppression, destruction and death. Fears have also been expressed that scientific progress may disturb the social system and lead to unemployment, the break-up of the family, and so on. Some people have concluded that scientific work must be stopped or that the applications of modern science must be banned. These suggestions are absurd, for if the work of science were halted, a large part of mankind would die of starvation or disease, and the life of the survivors would be less happy, shorter, more wretched.

The rapidity of scientific progress has not been accompanied by a comparable ethical advance in the field of international relations or the social order.

Scientists and university workers must strive to confine the application of their discoveries to the development of the material

and spiritual welfare of mankind, to constructive, not destructive, undertakings.

Pure science and applied science

The greatest discoveries of applied science derive from disinterested fundamental scientific research. We need only mention Galvani, Lavoisier, Faraday, Maxwell, Roentgen, Pasteur and Fleming to prove this. Without scientific research Universities and nations are condemned to inferiority.

In fact the distinction between theoretical and applied science is largely artificial. It is better to speak of science and the applications of science.

Even the champions of the idea that science's only task is to satisfy the material needs of daily life are compelled to admit that in achieving this end the fundamental sciences play a more important part than the applied sciences.

Science's search for truth must be carried on under conditions of complete liberty of research, discussion and expression. Such research is valuable in itself, and its social importance in the intellectual, technical and ethical fields is considerable.

The applications of science generally pass through three stages. First of all an independent, isolated worker makes an important discovery, starting from an original and individual inspiration which cannot be obtained to order or by planification. Then this discovery is developed and extended by many other workers ; at this stage team work is advisable, provided that individual freedom is not proscribed. Lastly these discoveries are developed and applied on the industrial and social level.

The University as a research centre

The Universities constitute the main centre for fundamental scientific research. This is a modern idea, and many Universities have not yet adopted it. The scientific spirit is lacking in many Universities, and the meaning of science and the rôle it plays in the University and in society is not understood. It is for this reason that in many Universities active science, that is research,

is not encouraged as it should be, and it is difficult to obtain full-time posts or grants for research. Various pretexts are invented to justify the refusal of these grants. It is maintained, for example, that the University's function is teaching, not research. Those who maintain this view forget or do not know that lecturers who carry out research make better teachers than those who do not, and that they train better pupils and more competent technicians.

Science progresses through research carried out by competent men and not through the mere existence of buildings, laboratories or apparatus. The bird is more important than the cage ; a nightingale will sing in a cage of wood or straw, while a sparrow will never sing even in a golden cage. An improvised scientist will never do anything worth while, even if he has at his disposal sumptuous laboratories and large grants. Money must first be spent to train competent men, then to provide these men with the means of carrying on research, and lastly to erect buildings for them.

The University must help the true scientists and provide them with assistants and pupils ; it must also train laboratory workers and research workers. It must be the centre for the intellectual, technical and ethical training of future scientists.

In recent years governments and businessmen have taken many scientists from the Universities, since they can pay much higher salaries and provide better-equipped laboratories. This trend is very dangerous for a country ; care must be taken not to diminish the quality of the holders of university chairs, which would lead to a rapid decline in the general scientific level.

The University and modern trends

The University is today faced with material, spiritual and social transformations brought about in society by scientific and technical progress and by political and social conflicts.

As a living organism the University is subject to environmental influences and must adapt itself to them. But it must not simply follow present trends ; it has a task of leadership to perform towards society, of leadership in thought, not action. The

influence of the University in orienting the society which supports it is profound, for it discovers and teaches the true facts, inculcates in the young a love of truth and culture, and teaches them to respect and aid others and to acknowledge the liberty and dignity of the individual.

But many conflicts and tensions arise between the University and its environment.

One of the most serious problems is the growing intervention of governments in all private activities, including those of the University. This operates directly through laws or decrees, or indirectly by the establishment of norms of behaviour. Subsidies and other forms of financial aid are often used by governments or other institutions to orient the University in a given direction. There is always a danger of loss of liberty accompanying any subsidy.

This interference takes many forms, but must in all cases be vigorously combated by the University if academic liberty is to be preserved. University teachers have been illegally dismissed because they were not members of a political party, or they have been appointed on the sole recommendation of such a party. Teachers have been dismissed because they taught evolutionism or genetics. Others have been compelled to give loyalty oaths and to swear that they were not members of one political party or another. Researches in biology or atomic physics have become official secrets ; this hinders scientific progress and prevents these results being applied immediately to improving the welfare of mankind. Government decrees are issued to settle scientific discussions or impose theories which thereby become dogma.

The Universities must energetically resist any interference aimed, however indirectly, at restricting academic freedom or the right to investigate, discuss and publish the results of scientific research without limitation of any kind. This attitude is indispensable, for without this liberty the University cannot accomplish its mission and will become a government propaganda agency. Moreover such resistance by the University will set an encouraging example for the maintenance of liberty.

Privately-financed Universities and Academies have generally

favoured the progress of culture and science more successfully than State Universities. It is sufficient to mention here the example of the United States, and it is highly regrettable that the fall in private incomes has affected the independent Universities and compelled them to accept official subsidies, although generally speaking they still retain their liberty.

Another danger lies in the attempt to give the benefits of university culture to the masses of the people instead of confining it to what thereby seems a privileged minority. This expansion is desirable in itself, but the University must not forget its function and must not lower its standards in order to make the education it provides accessible to the uneducated masses. The benefits of this education will be diffused throughout society through secondary or primary education, through university graduates, through books and through the science information services of the press or radio.

As technical education becomes more specialized, it must be preceded by a course in general culture. We must avoid producing specialists who are completely ignorant outside their speciality. Equally undesirable is the graduate whose knowledge is apparently extensive but nowhere thorough.

The University has duties towards society : it must extend our knowledge, improve standards of culture, and train good professional cadres. It is reproached for " shutting itself up in an ivory tower ", " turning its back on reality ", " concerning itself with intellectual games and not with practical matters ". The University must not let itself be influenced by these criticisms, which are often due to the ignorance or resentment of the masses, their rebelliousness towards everything superior to them. The University must remain faithful to its function, namely to seek truth disinterestedly, to study the fundamental problems of scholarship, and lastly to teach the young how to learn, while giving them a sound general and professional education. The applications of science are not its only or even its main function, for they will always be more important and numerous where fundamental research is carried out, but will become rarer and more limited where practical research is the only consideration.

Another serious problem arises from conditions today which

make it increasingly difficult for true academic aptitude to be detected and encouraged. Many young people who have a real vocation or gift for university or scientific work are compelled to seek a living elsewhere. Ways must be found of selecting the most gifted of these and helping them in their studies and in their scientific careers.

Similarly, scientists and university teachers must be treated with consideration by society and granted aid in their work and respect for their academic freedom. They must also be allowed the means to fulfil their duty and accomplish their vocation, without being obliged to renounce their rights as men and citizens.

It is imperative to improve relations between university teachers and scientists on the one hand and politicians and the masses of the people on the other, in order that the purpose of the University may be understood and achieved.

Finally, university teachers must establish wider and deeper relations with members of other Universities. There must be more congresses, more exchanges, and above all more international Fellowships.

To create conditions favourable to peace and understanding between nations, obstacles to freedom of information and exchanges of knowledge between scientists in all countries must be removed. This is of fundamental importance for human concord. This must be the beginning of an era of harmonious intellectual and scientific co-operation, and this fraternity of university teachers and scientists must serve as an example to encourage similar feelings in all men.

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