THE HUMANE FUNCTION OF SCIENCE

JOYCE C. STEARNS

AT THE time I was given this title for panel discussion I was not given a copy of the program nor even the topics assigned to other members of the panel. I did, however, know it was a conference on Humanities and remembered that my son was taking a course in Humanities in either the senior year of high school or second year of college —depending on how you looked at the matter—at the University of Chicago. I called him in to explain to me what Humanities were and he informed me that they were "man's work for man's enjoyment." I am proceeding on the assumption that this definition is as good as the many others that are abroad in our land. No one questions the word of either a senior in high school or sophomore in the four-year University of Chicago College.

I remember the story told by Mr. Kettering of an old invalid Negro who possessed none of the material resources of this life, but who was always happy. Mr. Kettering asked him how he could be happy under these condioitns and he replied that his happiness was due to his philosohy of life. Upon investigation it proved that his philosophy of life could be stated in the following statement: "Early in life I learned to cooperate with the inevitable."

In applying the subject of the humane function of science it becomes necessary for us to consider the "inevitables" we must face. Robert Patterson, Undersecretary of War, writes the following: "There is a great voice in the world today, the voice of science and technology. It is a voice heard since ancient times, but never until today has it spoken with such authority, have its words been so filled with promise, has it been listened to with such hope. And in no country in the world does the voice speak so eloquently as in our own.

"Science and technology have changed and are changing the lives of all men. Not a single aspect of our society but feels their advance. The things we make and use, the food we eat, the clothes we wear, the way we travel and communicate, the houses we build, the way we cure and prevent disease, the way we fight — and the way we shall win — have all been fashioned by science. Both war and peace move under the sign of research, discovery, and invention."

The first "inevitable" is that discoveries in these fields of science which are contributing to man's knowledge of the world in which he lives, and material contributions of science and technology, will continue at an accelerated pace. If we follow the method used by A. H. Compton and condense time by a million-fold we find that the great discoveries — telephone, radio, automobile, electric light, and practically all the services of science on which we are now almost dependent — have ocurred in the last half-hour of the life of our civilization which began, according to this time schedule, a few years ago.

Dr. Nyswander, formerly Physics Professor and Dean of the School of Science and Engineering at the University of Denver, used to express this matter by saying that, beginning with our grandfather, more scientific progress has been made from that time to the present than was made from the beginning of time to the time grandfather was born.

In normal times every scientific discovery broadens the horizon of possible discoveries and begets further progress in this field. At the present time we

are living in unusual conditions in which the scientific manpower of all nations engaged in war has been mobilized and provided with opportunities in terms of adequate funds and freedom from all other duties, to make exceptionally fast progress. Most of this progress is now being utilized for military purposes only; the scientific contributions to peacetime living have apparently leveled off during this period. When the war is over we may expect an abrupt increase which none of us is in a position to anticipate.

Further, such accelerated scientific progress cannot be stopped. Even agreements between industries are never effectual in this matter. As an example, the General Electric Company had to consider the problem of developing the fluorescent light. It appeared not to serve the best financial interest of the Company to develop this product, for fluorescent lights last longer and give more light per unit of power than does the incandescent lamp. It meant complete reorganization of the factory to sell fewer of a product which would bring them a smaller profit. The committee which reported to them stated that they had no alternative but to develop the lamp because if it was not done by General Electric, it would be done by Westinghouse; or even if a combine of all the large companies agreed not to develop the light, some smaller company would go ahead and develop it. Thus the only answer was to get into the work immediately. Incidentally, it has paid.

Neither can scientific progress be stopped by decree or persecution. Every so often the idea comes up that most of the sins of the world are due to the fact that science provides men with machines that make it easier for him to be a sinner. The Bishop of Ripon suggested that scientific progress should take a recess of some 2000 years during which time man might make himself so much better that he could be entrusted with new machines. When questioned on this subject he did not think Biology or Medicine should take this recess (they were humane sciences), but Chemistry should. When the matter was considered further it was found that all advance in Medicine was dependent on scientific advances in the fields of Chemistry, Biology, Physics, etc., and the bishop, therefore, proposed that these fields be limited to only those advances which would contribute to the advancement of medicine. Again it was pointed out that some of the most significant advances in the field of medicine have been made possible by discoveries in other scientific fields — discoveries which resulted from the sheer curiosity of the scientist and not in an attempt to aid his fellow men. The discovery of X-ray and radioactivity are examples.

Whether we like it or not, our first "inevitable" is that we are to live in a world in which scientific progress increases at an ever accelerated pace and that this pace will rise very sharply at the end of the present war, and our whole life will be influenced by this.

The second "inevitable" we must face is that the contributions of science give man power and leisure. The knowledge itself gained by science makes the man who possesses it more powerful. It enables him to see more in nature than the fellow man who does not have the same knowledge; in the same way the artist may see more of beauty in nature than does the ordinary layman. It does not take from him any of the basic emotions of ordinary people. The physicist who looks at a sunset and understands why the sky is red and blue receives the same thrill as does his brother who has no such understanding. The fact that he can look at the earth's bow in the eastern sky in the evening and compute the radius of the earth and establish the fact that it is a sphere,

makes him enjoy this beautiful sight no less that a Zionist who is thrilled at the beautiful picture but still thinks the earth is flat.

It is often stated that the scientist lives in a dark laboratory completely insulated from the cares and troubles of the world, and that he becomes indifferent and cold to the sufferings of his fellow man. This idea is so far from the truth that one wonders how it could ever have gotten a hearing. Perhaps it comes about because the man equipped with scientific knowledge and ecientific equipment can dispense sympathy more efficiently. A man with the proper scientific knowledge will not allow a person in an automobile accident to be moved; the crowd believes him to be devoid of sympathy. A skilled surgeon operates with no display of emotion— but those of us who have lived with such men know how they share the sufferings of others. There is no fanfare or noisy display in dispensing effective sympathy — don't be misled by the absence of tumult and shouting or the presence of a certain shyness and modesty.

The tools which the scientist develops give to man power, and the leisure which is his may be used for purposes bad, neutral, or good — for power enables man to be more humane or depraved depending upon the man or the direction given man by his superior. Unfortunately we have timely examples of these two extremes. In the recent war we used the most ingenious of machines to destroy life itself. The man with a flame-thrower, tank, submarine, or even the buzz-bomb without a man, enables life to be destroyed more effectively than can be done by old methods of warfare. How easy it is for us to transfer our enjoyment from the manly enjoyment of the prize-fighting ring to that of the battle field is illustrated by the profusion of bulldozer stories now pervading our land. At every club meeting someone tells about an American soldier who has become a hero by using a bulldozer to run over a foxhole occupied by Japs and thus kill and bury the Japs at the same time. This story seems to be a natural and usually get the apparent hearty reaction of all the men present. I, for one, have never been able to bring myself to enjoy the episode, even though I believe just as much as the next one that such procedures may be necessary.

On the other hand the work of our Red Cross and Medical Corps shows how humane it is possible for man to be when he is provided with tools of science. Blood transfusions, the administering of sulfa drugs and penicillin behind the lines to friend and foe alike, are true examples of the humane function of science. I have often wondered if it could not be possible to avert future wars by capturing enough wounded prisoners and winning their respect, understanding, and confidence by administering to them in their time of need. Actually the lives of as many people are saved in the same period of time by the scientific discovery of the X-ray and radium alone as are killed during a war. There is, however, this notable difference — war kills only the best and most promising. Further, while we are more efficient in offensive methods of war, we are also so efficient in defensive warfare that the cost of killing an individual in this war is soaring beyond all reasonable limits. You can get it done for about 1/1000th of the price by a Chicago gangster.

From an international point of view the humane function of science is to make it possible for the people of all nations to live comfortably without conquest. In the times of barbarism and savagery when man lived on what was provided by the land, the easiest method to secure more of the world's goods was to move to a land in which game and natural food were more abun-

dant. If it happened to be occupied by others, a war ensued; a horrible war in which one had to meet his opponent face to face and beat him to death with clubs and rocks. It probably would be just as well not to review the white man's conquest of North America at this point.

With the increase of scientific development the emphasis shifted from man's dependence on what nature provides to man's increasing of his own products, until today it is possible for any nation which has the courage to do so, to live by creating for itself rather than taking from others. Whatever the terms of the Versailles Peace Treaty, Germany passed up a golden opportunity. Had she elected to put the same amount of money, time, energy and manpower into scientific development in an effort to create the goods she needed so badly rather than to spend the same money for forging weapons with which she thought it would be possible to conquer the world, Germany would today be the most honored and powerful nation in the whole world, and she would have set an example which would have gone a long way toward promoting world order.

As a matter of fact, Switzerland has done that very thing. In this country which is so devoid of natural resources that most nations do not care to try to take it by conquest, they have developed scientific skills which allow them to furnish other nations with materials and services that cannot be produced elsewhere, and in return receive goods which they themselves need. What Switzerland has developed cannot be taken by conquest.

To summarize, the ability to make two blades of grass grow where one has grown before is increasing faster than the population and, if wisely used, amounts to making more land and resources available to free man from depending upon those products already stored by nature and to give to all of us an assurance of future freedom from want. It becomes increasingly easy for a man or a nation to live by creating resources — and more difficult to secure resources by conquest.

May I cite an example of what one individual has done in the field of race relations. No one has contributed as much to establish a bond between the Negro and the white man as has George Washington Carver. This was not done by soap box oratory, petition, or pamphlet. He worked as a scientist making it possible for his people to live more fully under conditions which were imposed upon them, and won a steadily increasing respect from all of us — a result which will never be lost.

Whether or not nations as a whole will use science in order that we may live together more happily and fully, or in constant distrust and fear which leads to war, depends on man himself. The schools of the United States, as well as other nations, will have the unusual opportunity to make contributions toward the proper adjustments for such living. As pointed out before, shortly after this war is over, scientific contributions which will make possible the larger production and wider and more economical distribution of materials needed for living will be released for the general public. In the schools at that time will be students who have gone through the present war, who have not only known the horrors of the battlefield but who will know how people around the world think, act, and live. We will not have just a few foreign exchange students, but thousands of them. Mingled with them will be a younger generation to whom the observations of the others may be transmitted. On the faculty will be many members returned from the battlefield or from research and development work in which for

the first time they have come face to face with the problems, policies, and ideals of men from military and industrial organizations. They are fully aware of the significance — social, economic, physical — of these scientific discoveries, and will be determined that the results of scientific discovery be used to make life more abundant for the many. On the other hand they are realists more than ever before, and as such are aware of the limited vision of people in high places. They know that people and nations must either learn to live together or else that civilized life cannot continue much longer. The highest goal of science is the welfare of human beings. The highest goal of the Humanities can not be far different. The Humanities and the sciences as part of our educational system are faced with their gravest problem, their greatest opportunity.[1]

---

[1] This is an address delivered by Dean Stearns at The Second Regional Conference of the Humanities, held at Denver, Colorado, December 1 ,2, 3, 1944, and reprinted from the proceedings of that conference, *The Hwmanities at Work,* with the permission of Dr. L. J. Davidson, Executive Secretary of the Conference.