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Is There "A Standard to Which the Wise and the Honest Can Repair"?

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MY TITLE IS A QUOTATION from George Washington, the "father of our country," who said: "Let us raise a standard to which the wise and honest can repair; the rest is in the hands of God." The question marks are my own. My questions are: Is there such a standard? Can we agree on such a standard? Who are the wise and the honest to rally around this standard? If there be such a standard and if there be any wise and honest men, I would say the rest is in the hands of man, not in the hands of God.

Were I to follow my own dictum that a scientist should keep his mouth shut and his pen dry until he knows all the facts, I would stop with the mere quotation from George Washington. However, on the basis of my understanding of man and my acquaintance with human history, I have also advocated in the past that a man's social responsibility is commensurate with his understanding of man and nature. If that is even approximately correct, we in the natural sciences surely have no less responsibility in the present dilemma of the race than have men in business, industry, and government. The "Atlantic Charter" promised us freedom from want and freedom from fear, if the war against Germany and Japan was waged to victory for our side. We have achieved victory, but our world is now plagued with more want and more fear—and on a larger scale than ever before. This is merely another illustration that war, violence, and destruction are probably not the best means by which to establish relative freedom from want of food and fear of further violence.

Men of science, particularly our colleagues in chemistry, physics, and engineering, are *praised* and *blamed* for producing during this war better and more effi-

cient weapons of destruction, specifically the atomic bomb. This has led, especially in the United States, to plans further to facilitate scientific research through federal-government financing, as a means for greater national security—that is, greater freedom from fear. On the other hand, there are voices, though less loud, charging that science, and the scientists, are primarily responsible for the increasing destructiveness of war and the increasing injurious effects of war on the human race, and these voices call for a moratorium on science and appeal to philosophy and religion for the answer to the dilemmas of the hour.

Before proceeding to discuss the standard George Washington had in mind and the wise and the honest who should rally around this standard, if such a standard can be found, let us dispose of some of the rather superficial accusations, charges, and fears that are current today—yes, even today, when the shooting, at least, of the worst war in human history is over.

Facing these dilemmas, not a few fellow citizens appear to substitute hysteria for history and sentiment for science. As I see it, science is as much and as definitely a part of nature as are the life-giving sunshine and the destructive tornado. To significantly or permanently retard or abolish science, we must fundamentally modify or destroy man, for science, in its final analysis, is the product of human curiosity. But temporary retardation of science can be achieved both by violence and by unwise legal or political dictation in times of peace as well as in times of war, for the processes of scientific research are not as simple as adding fertilizer and water to parched and depleted soils. In the latter case there is no problem of mental and physical freedom of the individual man, the individual scientist.

Address of the retiring president of the American Association for the Advancement of Science delivered at St. Louis, Missouri, on 27 March 1946. Ordinarily this address would have been delivered in December 1945, but due to wartime conditions this meeting was postponed to the spring of 1946.

Scientists are being urged to "knock at the door of politics." Scientists probably should do that, if in so doing we do not deviate from the path of science and continue to stick by the facts. If, when "knocking at the door of politics," we follow current political mores, we will injure science and render no service to society. Specific current examples of scientists "knocking at the door of politics" are the endeavor of American scientists to guide and improve federal legislation concerning the National Science Foundation and the organized endeavor of the American chemists, physicists, and engineers responsible for the development of the atomic bomb to foster national legislation having to do with publicity and control of atomic energy in the best interests of the future peace and prosperity of all men everywhere.

Yes, men of science are urged to "knock at the door of politics." I think that our social responsibility compels us to knock at this door, not only as individual citizens but as organized professional people. And yet Sir Josiah Stamp, former president of the British Association for the Advancement of Science, says: "The training of the scientist includes no awareness of the social consequences of his work, and the training of the statesman and administrator no preparation for the potentiality of rapid scientific advance and drastic adjustment due to it, no provision of the technical forces which are shaping the society in which he lives." Perhaps our "knocking at the door of politics" will be relatively futile until leaders in politics understand the scientific methods and the ethics of scientific research.

According to my best recollections, the standard which George Washington asked us to raise over a hundred years ago was not specifically described, but it undoubtedly related primarily to political, economic, and religious freedoms such as we usually designate under the term democracy. Certainly that standard, even raised by a leader of a rebellion, stands for peace rather than war as the human ideal toward which we must labor with all our knowledge and courage. We may also assume that George Washington's *standard* embodied the "golden rule." But as formulated by leaders of our race in the more distant past, the golden rule seems too utopian for man at the present stage of intellectual and social evolution. In international relations we usually follow the golden rule in reverse. We do unto others what we fear they are about to do to us; and if our enemy hungers, we starve him some more. But man today seems capable of such realistic application of the golden rule as is seen in open conferences, fair compromise, and honest cooperation. In international relations this formula seems at present the only substitute for war. Given even

moderate understanding and integrity in our political leaders, this procedure does not seem beyond human capacity of any race or nation today.

But is peace, as opposed to war, a possibility for the human race? It is a fact that some statesmen, some soldiers, some philosophers, and some fellow scientists say that intermittent wars are as inevitable as a part of man's struggle for existence and as nature's crude way of eliminating the less fit. If that is true, a standard looking toward a more durable peace among the human race is certainly not a standard to which the "wise and the honest can repair." That standard, the inevitableness and perennial perpetuity of war, is, of course, clearly opposed to the plan and, I hope, the efforts of the United Nations. If war is inherent and inevitable in human nature, all efforts in the plans of the United Nations are a sham, a delusion, and a snare. I, for one, do not accept this view as a scientific fact or as one rendered probable and inevitable by scientific facts; for war has been gradually eliminated between families, tribes, and even larger groups. To be sure, we still have violent revolutions within individual nations, where it is not a matter of threat or force from without, or matters of difference in religion, race, or skin color. But in recent years, at least, and where empires cover a large part of our globe, wars are violence between nations. Eliminating this last step may be more difficult, but biologically not less possible, than eliminating war between families and tribes.

If it is true that primary drives toward war and violence are greed, vanity, and fear, it may be argued that wars are inevitable as long as greed, vanity, and fear are not controlled or somehow checked by understanding, intelligence, and a growing sense of justice. I think mankind should reckon with this fact. The control of greed, vanity, suspicion, and fear by understanding and intelligence is going to be a slow process, even through modern travel, communication, and education, as long as modern communication and education are partly sidetracked toward increasing greed, suspicion, and fear. I think we can be more positive, however, in answer to those fellow citizens (industrialists, politicians, and scientists) who argue and find comfort in the supposed fact that war is beneficial to the human race in the sense of survival of the fittest and elimination of the less fit. In modern times the less fit physically and mentally are not drafted into the armed forces in any nation, except under extreme provocations. Hence, death and mental and physical injuries in the armed forces in war falls on the physically and mentally more fit of a nation's population. As we now wage war, not against the armies and the navies of the enemy, but against men, women, and

children of enemy countries, everyone can clearly see that atomic and other bombs, gunfire, poison gas, flame throwers, etc., do not discriminate between the fit and the less fit; the same is true of the sequelae of war: *starvation* and *epidemic disease*. In other words, modern war tends to render even the most fit less fit in body and mind for the functions of peace in every nation. Even with the partial understanding of the nature of man and the universe available during the last hundred years, it has been possible for some of the small nations to change from war to planned and persistent peace, by their own understanding and choice, even without the aid of an international police force, as is now being planned by the United Nations. My own forebears, the Scandinavian vikings, were not so long ago the scourge of Europe, warring, killing, and robbing in every accessible land. The descendants of these warriors have not waged war voluntarily for over a hundred years, but have used their energy and understanding in the arts of peace without, so far as we can judge, suffering national degeneration. Of course, on this latter point, a hundred years is but a pilot experiment. Finally, we now know enough of the role of heredity and health in mental and physical fitness to control the population percentage of the less fit more humanely and with less injury to man and nature than is done by war.

Who are the wise and the honest in the population, and who am I to indicate who the wise and the honest might be? We usually regard as honest a person who does not knowingly tell or report as facts what he knows not to be so or who does not leave out in his speech or writing some essential which actually changes the meaning or significance of what he does tell or report. It is in this sphere that men in science have, or should have, greater experience, training, and conditioning than the rest of mankind, because the scientific method and scientific research demand absolute integrity, the absolute sticking to the facts as known or discovered. This does not mean that the scientific investigator is by heredity more honest than other fellow citizens. It merely means that science and dishonesty do not mix—they are incompatibles. The scientific investigator who lies is soon found out and discredited by his fellow workers. It is less easy to do such checking, such discrediting, in other fields of human endeavor.

This necessity for honesty, absolute personal integrity, and the reporting of all discovered facts as found without their being colored by wish or hope, should aid the scientist in following the same mental processes in the common life about him and in national and international affairs. I need not tell this audience that this does not always happen. After

all, a scientist is a human being first and last and is subject to the same emotions, to the same national and international political pressures, fears, and hopes as are other human beings. All we can hope for ourselves is that we apply a somewhat larger element of the integrity, gained in science, in our common life as citizens of our nation and of the world.

The definition or designation of the *wise* is a more difficult task. That adjective implies wide factual knowledge and understanding, relative unselfishness, and a willingness to apply this understanding to problems where factual data are lacking. Human wisdom fails most conspicuously in passing judgment and acting on immediate needs, and in *neglecting the distant consequences*. This is intellectual shortsightedness—mental myopia. Man—that is, the human race—has dwelt on this earth at least a million years. It seems to me it is high time that those who would be wise should look ahead as to the consequences of their individual, national, and international actions, not only today and tomorrow, but a hundred, a thousand, a hundred thousand years ahead. As I see it, the person who has developed some control of his greed, his vanity, and his fears; who has developed to the limit of his brain the accumulated understanding of man and the universe, and who thinks in terms of his fellow men—the human race—not for the day, tomorrow, or even the next hundred years, but for a future at least as long as our human past; and who at the same time uses all his influence, without violence or coercion, to prevail on his fellow men to follow his example, is entitled to the connotation *wise*. We may then, even though dimly, select a standard and invite the wise and the honest to rally around it, even should this rally reveal but a corporal's guard in every land.

In my humble opinion the element in human nature and modern life forming the greatest obstacle to international peaceful cooperation, and hence the greatest force toward war, is dishonesty—lack of individual, national, and international integrity. This audience need not be told that guile, deceit, and double-dealing constitute the accepted international morality in all nations, though it is never put as honestly and baldly as I have just spoken. It usually takes the form of artistic lying. As long as this unfortunate behavior prevails among leaders in industry, trade, and politics, and in their international relations, it is difficult to see how genuine democracy can work, except by accident, or how genuine cooperation can be achieved in the international field. For example, we pretend to be shocked when it is reported as a “discovery” that other nations maintain spies in our midst. In spreading the publicity and pretended

horrors and wrath over such behavior, we forget to reveal that most, if not all, large nations, including our own, do just that thing in war and in peace. I, for one, fail to see how individual citizens in democratic nations or how individual nations in the United Nations can be held responsible for unwise, unfair, or violent actions when the political leaders in these nations and in the new United Nations do not put all the cards on the table, face up, as is done in science.

We Americans profess the ideals of democracy at home and endeavor to spread these ideals in other lands, and yet we agreed to set up in the United Nations a plan by which one of the five so-called great powers can block any action against the violation of the principles of democracy, justice, and fair play on the part of any one of these five larger nations. This is, of course, autocracy—not democracy, but perhaps this halting way is the only path for a hopeful start. I say “hopeful,” because we must consider that some day in the future the leaders of these five great powers will be men of greater wisdom and integrity, men of wider and longer vision, than the political leaders in these nations today. When that day arrives, the responsible leaders will be superior to the present plan, and the plan itself will be a dead letter.

In my humble judgment the now defunct League of Nations failed to promote world peace and prevent the most devastating world war in human history, not so much because of faults in plans and powers of the League or because of the fact that our own country did not join the League, but because of lack of real faith in the League—that is, lack of integrity in the leaders of the dominant nations in the League. To them the League ideals and plans were just window dressings behind which the old game of national pride and national power politics went on as of yore. I fear seriously that this same lack of national and international integrity infests at least some of the leading powers of the United Nations. I see no other explanation of the supposed serious adherence of the five leading powers to this new international organization, parallel with the evident start of an individual armament race by the same major nations—an armament race starting, at least so far as plans go, before the guns of World War II even had time to cool. It seems clear to me that the United Nations’ efforts toward world peace and the armament race and old-style military alliances of the five leading world powers are definitely incompatible. International cooperation on the basis of the prevailing ethics of past and current international diplomacy is a delusion and a snare. Hon-

est men with average understanding cannot even hope that it will be effective. Mr. Winston Churchill, co-author of the four freedoms of the Atlantic Charter, now appears to identify peace with military force, and he asks for military alliances against a resurgent imperial aggression by Russia. We may well ask: Are military alliances in support of empires already built by force any less injurious to the human race than are such military alliances for building new empires by military force? History seems to show that, in the long run, neither are in the best interest either of the masters or of the slaves. The political leader of a great and friendly nation said recently that future peace demands that we treat our fellow men in every land as brothers. At the very hour this political leader made this humane and biologically sound proposal his own soldiers were killing their fellow men in the speaker’s own imperial colonies. Killing these people for what crimes?—for the crime of demanding the very freedoms which the people in the speaker’s homeland achieved centuries ago. To me, this does not make sense. It adds up to lack of integrity, for this political leader is not a moron.

We Americans insist, and I think justly, that Japan give up all political and commercial control secured by force on the continent of Asia, but we are rather silent about Great Britain’s control of part of China, a control also secured by force. We considered the Japanese control of islands in the mid-Pacific Ocean as a menace to our security. Now we propose to retain control of islands at the very door of China and of Japan. We insist that we are a peaceful people, yet we have waged three major wars in less than 50 years. Can we expect other nations to forget that fact? Is it not true that actions are more convincing than mere words?

Many fellow scientists and not a few citizens in the professions, in education, in industry, and in government appear to think that current false ideas and conceptions of *race* are serious causes of fear and hatred leading to violence and war. The science of biology and anthropology has clearly made out that, despite differences in skin color, anatomic details, language, culture, and religions, *the present human race on the face of this earth is biologically one species*. We have no sound scientific basis for the belief or the superstition of superior and inferior races of men. I am the last one to deny that the superstition of national inferiority or superiority has in the past been one of the causes of violence and war. But we have had civil wars in nations of very great racial homogeneity, nations with identical language, customs, religion, and traditions. We have had many wars between nations where there can be no question

of fundamental racial differences, such as between Germany and England, Germany and France, Italy and France, Poland and Russia, China and Japan, etc., etc. The realization on the part of all men that the present human race is one species will by itself not abolish war. However, it should aid in this direction, and I should be the last one to minimize the importance of this aid toward a more durable world peace.

Many colleagues put great faith in better education, more universal education of all people in every land, as a prophylactic against future wars. As in the case of the problem of race and human unity, I should be the last one to minimize the importance of education, particularly if this could embrace an understanding of the folly and the waste of war, the value and necessity of human cooperation and fair play, the immediate and the long-range injuries to man from modern wars. But education itself is not the cure-all, is not the universal panacea. Men in every nation with the best education that modern understanding has been able to contrive have become war mongers and warriors by the old urges of greed, vanity, fear, and actual or alleged industrial needs. However, education rather than propaganda is one of our means towards a better day, and we should give our fullest support to the United Nations' Educational, Scientific, and Cultural Organization. It is obvious, however, that this must be factual education rather than propaganda—that our cultural emissaries to other lands, or in the service of the United Nations, should look at themselves and their own nations in the mirror of current and past history as frequently as they look at the errors and mistakes of our fellow men in other lands. In the last 50 years men in the natural sciences have had no difficulty in understanding, in fully appreciating the efforts of, and meeting on common grounds with, fellow scientists from every nation of the earth. In the natural sciences, at least, we do not need so much additional practice in fair and humane international relations with our fellow scientists. In saying that, I do not point a finger at other fellow citizens with fewer international contacts than the natural scientists; for, after all, we meet on the common ground of controlled facts and checked experience, arrived at through human ingenuity, under conditions of relative freedom of the individual scientist. That does not apply to those who travel the international road to distant lands with commercial interests, conflicting national aims, or fossilized political theory.

Despite some acquaintance with history and considerable experience in peace and war in many lands, I may be off the beam when I say that modern industry itself is at times a potent cause of war. Such

industries, developed in locations or in nations where raw materials must be secured from other lands, the products of the industry disposed of largely in other lands, and with a population in excess of the food resources of the country, obviously render the people in those countries dependent on peaceful cooperation or war with other nations. When competing industries develop in other lands, conflicts are inevitable, both as to the raw materials and as to fields of trade. Political and industrial diplomats usually camouflage these conflicts with more altruistic and palatable connotations. We now discern such conflicts in new regions as a consequence of the recent elimination of Germany and Japan from the industrial scene.

In addition to building springboards for war, modern industry, by literally turning the earth inside out at a rate to which living forms have never before been exposed, has created other hazards to man's health and welfare. The atomic bomb is the culmination, not the initiation, of these new and man-made enemies. Given facilities and freedom, medical and engineering science of tomorrow may master this most recent enemy of man.

If there be a third world war, bigger and better atomic bombs will wreck and retard our industrial civilization. But such a war will not obliterate our species; and, lest current fears make us forget, many civilizations of the past have decayed and disappeared without the aid of the weapons of modern warfare. Slavery, parasitism, chicks that chirp but do not scratch, are potent enemies of our race. War, violence, and atomic bombs are on the screen for the moment, but these are but some of our many enemies.

In the past, we in the natural sciences have regarded it as self-evident and obvious that discoveries in science are not for personal or national gain. Such discoveries are for the increased understanding and aid of mankind. Is this principle, is this philosophy, wrong? Is the black-out of this principle by war necessary? And if necessary in actual war, is the black-out necessary for individual national security for an indefinite period during peace? I raise the question because it is one now pending, particularly in our own country, and because it has significant meaning for the entire human race. If the principle of the black-out in science shall prevail in war and in peace, science becomes not an instrument of understanding but an instrument of additional suspicion and fear.

Our Association embraces all science, all American scientists, and not a few scientists in other lands and climes. No one scientist can speak for all men of science, but you are in a position properly to value,

if not condone, my insistence that next to man himself—that is, man's unchecked greed, vanity, and fear—disease is man's major enemy, at least until depletion of national resources for industry and insufficient foods loom larger on the distant horizon. As a biologist I deplore the diversion of tens of thousands of competent scientists and such large fortunes in human toil, past, present, and future, to devising better ways to kill and injure our fellow men, better ways to waste and destroy our natural resources by war, because the frontiers of biology and medicine are still so vast. We have scarcely made a dent in the matter of prevention of the hereditary defects of man, of cancer or virus diseases, of the preventable impairments of the aging citizen. It seems stupid to pause to kill and maim our fellow men when there remains so much worthwhile work to do toward developing a healthier, wiser, and happier man of tomorrow.

Unless guile is coequal with integrity in man's survival and progress, it seems obvious that integrity, cooperation, and approximate justice constitute the very warp and woof of the "standard" to which all wise and honest men must repair. We certainly get nowhere with guile in the understanding and control of inanimate nature or in the understanding and control of heredity, health, and disease in living nature. We can, for a time, guide human action by guile and force. Some day our colleagues in the social sciences, by the methods and ethics known to work in the natural sciences, will provide man with data on human behavior which are as reliable and as unavoidable as are the confirmed data of chemistry and physics of today. When that day is here, guile and guess in human relations will surely recede, assuming that man of that era retains present mental capacities.

Science Legislation

On the Floor of the Senate

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On 19 March the Senate Committee on Military Affairs considered the Kilgore-Magnuson Bill, S. 1850, creating a National Science Foundation, and reported it out of committee. S. 1850 is now on the floor of the Senate.

It has taken seven months to compose a bill that meets the requirements of scientists, government agencies, and the small group of Senators actively interested in science legislation, and to get this bill through committee. Comparable delays in the Senate and in the House can be fatal, for a third of our Senators, and all of our Representatives, are understandably concerned with election problems back home. Congress is not going to remain in session any longer than it must. It certainly will not linger for the purpose of creating a National Science Foundation unless Congressmen know that some of the influential people in their respective districts believe that this is important and enlightened legislation, which should have their support in the present Congress and not a promise of support in the next session.

On 16 March Senator Thomas of Utah, chairman of the Committee on Military Affairs, addressed a meet-

ing at which 19 of Philadelphia's scientific organizations were represented. Senator Thomas, who is a member of the AAAS, devoted most of his time to a discussion of the significance of S. 1850 when he talked to the representatives of these organizations. Rather pessimistically, he pointed out the preoccupation of Congressmen with problems of re-election and ventured the prediction that S. 1850 can die in the Senate, and will almost surely die in the House—unless scientists show much greater interest than they have up to the present time.

Senator Thomas is so impressed with the wisdom of this bill that he pledged himself to reintroduce it in the next session, if it failed of passage this year. But failure this year means serious delay. It means that the teams of scientists who were at work during the war will become even more dispersed, more difficult to reassemble to pursue the research tasks of peace. Although scientists will appreciate the wholehearted support of Senator Thomas, it was clear from his remarks that they must assume a great deal of the responsibility for the ultimate passage of the bill, and practically all of the responsibility for its passage in this session.