

Speech to the Association of Los Alamos Scientists

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What has happened to us -- it is really rather major, it is so major that I think in some ways one returns to the greatest developments of the twentieth century, to the discovery of relativity, and to the whole development of atomic theory and its interpretation in terms of complementarity, for analogy. These things, as you know, forced us to re-consider the relations between science and common sense. They forced on us the recognition that the fact that we were in the habit of talking a certain language and using certain concepts did not necessarily imply that there was anything in the real world to correspond to these. They forced us to be prepared for the inadequacy of the ways in which human beings attempted to deal with reality, for that reality. In some ways I think these virtues, which scientists quite reluctantly were forced to learn by the nature of the world they were studying, may be useful even today in preparing us for somewhat more radical views of what the issues are than would be natural or easy for people who had not been through this experience.

In considering what the situation of science is, it may be helpful to think a little of what people said and felt of their motives in coming into this job. One

always has to worry that what people say of their motives is not adequate. Many people said different things, and most of them, I think, had some validity. There was in the first place the great concern that our enemy might develop these weapons before we did, and the feeling -- at least, in the early days, the very strong feeling -- that without atomic weapons it might be very difficult, it might be an impossible, it might be an incredibly long thing to win the war. These things wore off a little as it became clear that the war would be won in any case. Some people, I think, were motivated by curiosity, and rightly so; and some by a sense of adventure, and rightly so. Others had more political arguments and said, "Well, we know that atomic weapons are in principle possible, and it is not right that the threat of their unrealized possibility should hang over the world. It is right that the world should know what can be done in their field and deal with it." And the people added to that that it was a time when all over the world men would be particularly ripe and open for dealing with this problem because of the immediacy of the evils of war, because of the universal cry from everyone that one could not go through this thing again, even a war without atomic bombs. And there was finally, and I think rightly, the feeling that there was probably no place in the world where the

development of atomic weapons would have a better chance of leading to a reasonable solution, and a smaller chance of leading to disaster, than within the United States. I believe all these things that people said are true, and I think I said them all myself at one time or another.

But when you come right down to it the reason that we did this job is because it was an organic necessity. If you are a scientist you cannot stop such a thing. If you are a scientist you believe that it is good to find out how the world works; that it is good to find out what the realities are; that it is good to turn over to mankind at large the greatest possible power to control the world and to deal with it according to its lights and its values.

There has been a lot of talk about the evil of secrecy, of concealment, of control, of security. Some of that talk has been on a rather low plane, limited really to saying that it is difficult or inconvenient to work in a world where you are not free to do what you want. I think that the talk has been justified, and that the almost unanimous resistance of scientists to the imposition of control and secrecy is a justified position, but I think that the reason for it may lie a little deeper. I think that it comes from the fact that secrecy strikes at the very root of what science is, and

what it is for. It is not possible to be a scientist unless you believe that it is good to learn. It is not good to be a scientist, and it is not possible, unless you think that it is of the highest value to share your knowledge, to share it with anyone who is interested. It is not possible to be a scientist unless you believe that the knowledge of the world, and the power which this gives, is a thing which is of intrinsic value to humanity, and that you are using it to help in the spread of knowledge, and are willing to take the consequences. And, therefore, I think that this resistance which we feel and see all around us to anything which is an attempt to treat science of the future as though it were rather a dangerous thing, a thing that must be watched and managed, is resisted not because of its inconvenience -- I think we are in a position where we must be willing to take any inconvenience -- but resisted because it is based on a philosophy incompatible with that by which we live, and have learned to live in the past.

There are many people who try to wiggle out of this. They say the real importance of atomic energy does not lie in the weapons that have been made; the real importance lies in all the great benefits which atomic energy, which the various radiations, will bring to mankind. There may be some truth in this. I am sure that there is truth in it, because there has never in the past been a new field opened up where the real fruits of it have not been invisible at the beginning. I have a very high confidence that the fruits -- the so-

called peacetime applications -- of atomic energy will have in them all that we think, and more. There are others who try to escape the immediacy of this situation by saying that, after all, war has always been very terrible; after all, weapons have always gotten worse and worse; that this is just another weapon and it doesn't create a great change; that they are not so bad; bombings have been bad in this war and this is not a change in that -- it just adds a little to the effectiveness of bombing; that some sort of protection will be found. I think that these efforts to diffuse and weaken the nature of the crisis make it only more dangerous. I think it is for us to accept it as a very grave crisis, to realize that these atomic weapons which we have started to make are very terrible, that they involve a change, that they are not just a slight modification: to accept this, and to accept with it the necessity for those transformations in the world which will make it possible to integrate these developments into human life. As scientists I think we have perhaps a little greater ability to accept change, and accept radical change, because of our experiences in the pursuit of science. And that may help us -- that, and the fact that we have lived with it -- to be of some use in understanding these problems.

Those are very far-reaching changes. They are changes in the relations between nations, not only in spirit, not only in law, but also in conception and feeling. I don't know which of these is prior; they must

all work together, and only the gradual interaction of one on the other can make a reality. I don't agree with those who say the first step is to have a structure of international law. I don't agree with those who say the only thing is to have friendly feelings. All of these things will be involved. I think it is true to say that atomic weapons are a peril which affect everyone in the world, and in that sense a completely common problem, as common a problem as it was for the Allies to defeat the Nazis. I think that in order to handle this common problem there must be a complete sense of community responsibility. I do not think that one may expect that people will contribute to the solution of the problem until they are aware of their ability to take part in the solution. I think that it is a field in which the implementation of such a common responsibility has certain decisive advantages. It is a new field, in which the position of vested interests in various parts of the world is very much less serious than in others. It is serious in this country, and that is one of our problems. It is a new field, in which the role of science has been so great that it is to my mind hardly thinkable that the international traditions of science, and the fraternity of scientists, should not play a constructive part. It is a new field, in which just the novelty and the special characteristics of the technical operations should enable one to establish a community of interest which might almost be regarded as a pilot plant for a new type of international collaboration. I speak of it as a pilot plant because it is quite clear that the control of

atomic weapons cannot be in itself the unique end of such operation. The only unique end can be a world that is united, and a world in which war will not occur. But those things don't happen overnight, and in this field it would seem that one could get started, and get started without meeting those insuperable obstacles which history has so often placed in the way of any effort of cooperation. Now, this is not an easy thing, and the point I want to make, the one point I want to hammer home, is what an enormous change in spirit is involved. There are things which we hold very dear, and I think rightly hold very dear; I would say that the word democracy perhaps stood for some of them as well as any other word. There are many parts of the world in which there is no democracy. There are other things which we hold dear, and which we rightly should. And when I speak of a new spirit in international affairs I mean that even to these deepest of things which we cherish, and for which Americans have been willing to die -- and certainly most of us would be willing to die -- even in these deepest things, we realize that there is something more profound than that; namely, the common bond with other men everywhere. It is only if you do that that this makes sense; because if you approach the problem and say, "We know what is right and we would like to use the atomic bomb to persuade you to agree with us," then you are in a very weak position and you will not succeed, because under those conditions you will not succeed in delegating responsibility for the survival of

men. It is a purely unilateral statement; you will find yourselves attempting by force of arms to prevent a disaster.

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I think that we have no hope at all if we yield in our belief in the value of science, in the good that it can be to the world to know about reality, about nature, to attain a gradually greater and greater control of nature, to learn, to teach, to understand. I think that if we lose our faith in this we stop being scientists, we sell out our heritage, we lose what we have most of value for this time of crisis.

But there is another thing; we are not only scientists; we are men, too. We cannot forget our dependence on our fellow men. I mean not only our material dependence, without which no science would be possible, and without which we could not work; I mean also our deep moral dependence, in that the value of science must lie in the world of men, that all our roots lie there. These are the strongest bonds in the world, stronger than those even that bind us to one another, these are the deepest bonds -- that bind us to our fellow men.