

~~subscribed to the report to me~~

October 24, 1950

I am supposed to speak to you tonight about the moral responsibilities of scientists. But I wish to say at the outset that I am not going to discuss what scientists should or should not do. Instead I shall try to examine to what extent scientists are in fact guided by moral considerations.

The term "scientist" is a ^{rather} vague ^{one} term, and I ~~think~~ had better ^{or} make ^{it} clear whom I have in mind if I speak of scientists. ~~In order to do so I wish to tell you a story which I heard during the war.~~

A man was passing a building site, so the story goes, and asked one of the workmen what he was doing there. "I am ~~earning~~ ^{making} 90 cents an hour," said the workman. The man turned to a second workman and asked the same question. "I am fitting bricks into this wall," said the second workman. The man then turned to a third worker and ~~he~~ this one replied, "I am ^{the} building a cathedral."

Undoubtedly many ~~of~~ ^{of} scientists at Los Alamos ~~are~~ ^{probably} working on the hydrogen bomb. But if you went to Los Alamos you would find that many of the ~~scientists~~ ^{scientists} are there because their wives wanted to go there. New Mexico has a splendid climate and mothers would rather bring up their children there than in any of the big cities of the East. ~~Many~~ ^{in Los Alamos} of the other scientists, ~~you~~ ^{might} find, are ~~there~~ ^{in Los Alamos} because the kind of work they are doing there interests them from a purely technical point of view. And finally you would find a few ~~scientists~~ ^{in Los Alamos}, probably very few, who are ~~there~~ ^{in Los Alamos} because they think it is important for the preservation of the freedom of mankind that the United States should have as soon as possible available hydrogen bombs. But even though there are only a very few men in Los Alamos who ~~will~~ ^{say} they are building a cathedral, you can be certain that 99 per cent of all the ideas ~~which~~ ^{which} go into the development ~~of~~ ^{of} the hydrogen bomb will come from these few men.

Because these few men are so important, I should like to say a few words ~~in their defense~~ ^{Not in} in their defense; ~~in~~ ⁱⁿ order to defend their views, but rather in order to explain their attitude. ~~The attitude of most scientists who are their equals and who are their equals both morally and intellectually and who stay away from Los Alamos is different from theirs, and I shall speak about them later.~~ These men

Just a remark of "scientists" from them on a school always means

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~~In Los Alamos~~ follow their own conscience. Because of the many values that they cherish in life, freedom as we know it appears to be in the greatest danger today, they have come to regard freedom as a value which transcends all other values. Some of them ~~may~~ ^{might even} have come to regard freedom as more important than life itself, not only in the sense that they would be willing to give up their own life for the sake of preserving the freedom of others, but also in the sense of believing that if freedom cannot be preserved ~~all~~ ^{on this earth} around them, life is not worth being preserved ~~on earth~~ either.

You might think that views of this sort border on insanity and that may or may not be so, but in any case the men who hold such views follow their own consciences and do what they consider to be their moral responsibility. It is my feeling ^{through} that they represent among scientists a small minority. What then about the majority?

Following the decision of the United States Government to push forward the development of the hydrogen bomb, a distinguished group of physicists issued a statement following a meeting of the American Physical Society in February, 1950. This statement was signed by S. K. Allison, K.T. Bainbridge, H.A. Bethe, R.B. Brode, C.C. Lauritsen, F.W. Loomis, G. B. Pegram, B. Rossi, and F. Seitz, M.A. Tuve, V.F. Weisskopf, M.G. White. I am going to read you three paragraphs of the statement:

"We believe that no nation has the right to use such a bomb, no matter how righteous its cause. This bomb is no longer a weapon of war but a means of extermination of whole populations. Its use would be a betrayal of all standards of morality and of Christian civilization itself."

I read you this paragraph which expresses a sentiment which underlies the statement and I am now going to read you the last two paragraphs which contain concrete recommendations. ~~Of these two paragraphs we are concerned~~ ^{here only with the last one.}

"To create such an ever-present peril for all the nations in the world

is against the vital interests of both Russia and the United States. Three prominent Senators have called for renewed efforts to eliminate this weapon, and of other weapons of mass destruction from the arsenals of all nations. Such efforts should be made, and made in all sincerity from both sides.

"In the meantime, we urge that the United States, through its elected government, make a solemn declaration that we shall never use this bomb first. The only circumstance which might force us to use it would be if we or our allies were attacked by this bomb. There can be only one justification for our development of the hydrogen bomb, and that is to prevent its use."

Clearly the recommendation that the United States should pledge itself not to use its bomb first makes from a logical point of view no sense, for it does not matter a great deal whether our cities are destroyed with ~~xxx~~ hydrogen bombs or ordinary atomic bombs of the Nagasaki type and assuming that our cities are attacked by ordinary atomic bombs, what sense does it then make to say that we are not going to retaliate with the biggest bombs we have and shall confine ourselves to retaliation with smaller bombs?

Now I think it is obvious that these twelve distinguished scientists are ~~xxx~~ perfectly capable of logical reasoning and that we have to interpret their ^{lack of logic} illogical reasoning as an expression of their unhappiness. I shall ^{now} try to ~~make you understand~~ ^{to show} first what the causes of that unhappiness are and second, what ~~it is~~ ^{its} consequences are. I believe the source of the unhappiness of scientists can be put down to three related sources.

Let me ~~reverse~~ reverse the order and describe first the consequences of this unhappiness. Before the last war in 1939 and 1940, ~~the~~ ^{most} scientists thought it very likely that war would come and they thought it likely that the United States would be involved. They thought that Hitler's government was evil and moreover they thought that the government of the United States ~~stood for the same ideals and was guided by the same ideas as was the scientific community.~~ ^{had the same concerns about right and wrong as they}

The scientists felt one with the government. They did not wait for the government to begin to ask for them to work on uranium or radar, ~~but~~ ^{they} started to work in these fields ^{on their own} and they went to great lengths to persuade the government to make use of their services. To put in symbolic form, in 1939 we talked about what we might do in case of war when we meant what the government of the United States might do. Today the situations appear to be very different. When a scientist discusses war and what the government might do, they don't discuss what we might do, but rather what they might do. Today ^{judging} most scientists consider the probability of a ~~next~~ world war in the next few years ~~just~~ ^{as} great ~~as they considered it in 1939~~ and the involvement of the United States if there is a war ~~is not only probable but certain.~~ ^{is} Yet ^{to say} the scientists are not pushing the government to make use of their services. Now and then a distinguished scientist will make a speech or write an article saying that the time has come for scientists to adopt ^{a different} ~~the~~ attitude to do what they did in '39 or to urge the government to go forward with one kind of development or another, but these very same scientists who speak this way do not take action themselves. They remain ^{at their place where} ~~in their laboratories~~ ^{present} or at best concern themselves with national defense to the extent of spending their vacation in Los Alamos or some other government establishment. Today Scientists if they ~~are~~ ^{are} approached by the government ^{would not} ~~will~~ not say no. They ~~will~~ ^{would} comply. ^{do} They ~~will~~ ^{would} do the job, but it ~~doesn't~~ ^{is} seem as if their heart is in their job. ^{heart} ~~There is no difficulty in filling government laboratories, but they are mostly filled by those who are earning 90 cents an hour or who fit bricks into the wall. There is little doubt in my mind that there is deep reaching estrangement between~~

the scientists and the government and we have to look for the causes of that ~~astrangement~~. In 1939 ~~there~~ there was no difference between the moral standards of the scientists and the moral standards embraced by the government. When in 1939 President Roosevelt warned the belligerents of Europe against attacking each other's cities with bombs, thus carrying the war to the civilian population, he only expressed what was at that time popular opinion of the people of the United States. Germany's attack on Rotterdam was regarded as an atrocity un-~~paralleled~~ paralleled in history, and no one would have thought of listening to Germany's excuses that this attack was made to shorten the war and ultimately save lives both Dutch and German. There is no doubt whatsoever in my mind that if it hadn't been for identical use of such methods by America and Great Britain, the bombing of cities would have been defined as a war crime and that those guilty of it would have been tried at Neuremburg and hanged.

The first news that we were attacking the cities of Japan with jellied gasoline bombs reached a group of scientists working at the University of Chicago on ~~xx~~ the chain reaction ~~xxx~~ by way of rumor, and I remember still very vividly the response which it evoked. The adoption of this type of warfare was never declared by the government nor was there even an attempt to explain this justification. ^{the} to the public at ~~this~~ time when it was adopted. The news of this type of warfare was permitted to ~~gradually~~ ^{gradually} in the newspapers and gradually the man in the street got accustomed to hearing about it. When the atomic bomb became available for use, the war against Germany had been won and ~~the war against Japan had been~~ ^{essentially won in the sense that the Japanese knew that they had no chance for} ~~essentially won in the sense that the Japanese knew that they had no chance for~~ ^{victory and in the sense that our government knew that Japan was} ~~xxxx~~ essentially defeated. In the circumstances there was a strong sentiment among scientists in the Chicago laboratories against the use of the bomb against the cities of Japan. A memorandum sent to the Secretary of War expressed the misgivings of the scientists and when it became clear that considerations of expediency would carry the day, a petition was sent to the President. ~~We stressed the moral~~

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by modern times
 The pursuit of science has not only its internal but also its external rewards. *and the number of scientists has become quite large and*
~~the men who fall into the category of the third worker~~ represent a minority of the professional scientists. *scientists so kind as the cathedral*
 yet the overwhelming majority of original contributions to science comes from *his minor's and not from* them and not from the ~~rest~~ majority *those*
 who make 90 cents an hour or fit the bricks into the wall.

Even though ~~it~~ *it* should be said that the contribution of those who fit the bricks into the wall *must not be underestimated* cannot be entirely neglected in the field of science either, *entirely neglected*, yet for the purpose of this talk we shall do so. *and whenever I speak of scientists,*

I shall have in mind only those who fall into the category of the third worker. and whenever I speak of scientists here I shall mean those who created the cathedral. —

Insert 2

But even though there are few, *yet* you can be certain that practically all the ideas on the hydrogen bomb will come from them rather than the others.

Insert 3.

Now it is obviously easy to see that from a logical point of view, this last recommendation makes *little* ~~valid~~ sense. How can scientists ask the government of the United States to make such a pledge. It would bind the United States *not* to ~~attack the states~~ *attack the states* of an enemy with Hydrogen bombs *even though our own cities* may be attacked *by our cities* with ordinary atomic bombs. There obviously we couldn't ~~xxx~~ very well expect our cities to be immune from attack from ordinary bombs if we are going to use ordinary atomic bombs against the *cities* of our enemies *we could not*

Since it is clear that these twelve distinguished scientists are perfectly capable of logical reasoning ~~xxxxxxxxxxxxxxxx~~ we must take their lack of logic as an expression of their unhappiness. Clearly they have to violate one loyalty or else they have to violate another, and ~~if~~ they want they have to violate the rule of logic. I consider it my task to try and define first what are the causes of the unhappiness of the scientists; and second, what are ~~of~~ the consequences of this unhappiness.

Let me reverse the order and describe first the consequences of this unhappiness.

Before the last war in 1939 and 1940 most of us thought it very likely that war would come and we thought it likely that the United States would be involved. We thought that Hitler's government was evil and was bent on conquering Europe with fair means or foul. There was no doubt in our minds concerning the ^{nightmare} ~~reality~~ of the United States Government. ~~The United States was a democracy and the government of the United States was by and large guided by public opinion~~
~~and~~

Insert 1

In modern time the pursuit of science has not only its internal but also its external rewards. The number of scientists has become quite large. The scientist who builds a cathedral represents today a minority of the profession --yet significantly most of the original contributions to science come from this minority and not from those who make 90 cents an hour or fit the bricks into the wall.

The contribution of those who fit the bricks into the wall must not be entirely neglected. Yet we shall do so for the purposes of this talk. Tonight whenever I shall speak of scientists I shall speak only of those who build a cathedral.

Insert 2

But even though they are few, yet practically all the ideas on the hydrogen bomb will come from them rather than from the others.

Insert 3

Now, it is obviously easy to see that from the logical point of view this last recommendation makes little sense. How can scientists ask the government of the United States to make such a pledge? It would bind the United States not to attack the cities of an enemy with hydrogen bombs who may be attacking our cities with ordinary atomic bombs. These twelve men do not ask the government to pledge itself not to attack the cities of an enemy with ordinary atomic bombs, and we are going to use ordinary atomic bombs against their cities surely we can expect them to use atomic bombs against our cities.

Since it is clear that these 12 distinguished scientists are perfectly capable of logical reasoning, we must interpret their lack of logic as an expression of their unhappiness. They are in a conflict of loyalties, they have to violate either one loyalty or another and since they want to violate neither they have to violate the rules of logic.

Can we understand the state of mind of these scientists? I consider it my task tonight first to try to divine the causes of their unhappiness and second to try to describe the consequences of their unhappiness.

There was no cleavage between our own moral standards and the moral standards of the government. We did not wait for the government to ask us to work on uranium or radar. We started to work in these fields on our own, and we went to great lengths to persuade the government to make use of our services.

Today again most scientists consider the probability of ~~the~~ world war within the next few years as very great. Today many scientists are deeply distrustful of the ultimate intentions of the Russian government and none have doubts that if war comes, the United States will be involved. Yet today the scientists are not pushing the government to make use of their services. Now and then a distinguished scientist will make a speech or write an article saying that the time has come to leave their peace time research pursuits and make their services available to the government, yet these very same men who write and say such things remain in their laboratories continuing their peace time researches. At best they spend their summer vacations at Los Alamos or some other government establishment. This does not mean at all that the government would have any difficulty today to get the cooperation of scientists if it were to approach them. Very few scientists, if any, would say no and there is little doubt they would do their job. But whether their heart would be in their job would be an open question and a very important one. There is valid doubt in my mind that there is a deep astrangement between the scientists and the government and it is my purpose tonight to devine the causes for that astrangement. I can offer you no more here than guess, but if my guess are right, this astrangement today gets its nourishment from four different sources which we have to explore only one. In 1939 and 1940, public opinion in the United States was undivided in condemning the waging of warfare against civilians which later culminated in the destruction of cities by bombardment from the air. When in 1939 President Roosevelt warned the belligerents in Europe against

attacking cities from the air he did no more than give expression to undivided public opinion and Germany's attack on Rotterdam thus was regarded as ~~an~~ unparalleled in history. The German attack on Rotterdam was down for and the German's could have argued that it shortened the war and thereby saved lives both German and Dutch, but no one would have accepted this as a valid argument. Everyone thought that the moral issues involved transcended any expediency of governments that might be involved. There is no doubt whatsoever in my mind that had ^{England} ~~Europe~~ and American not resorted in the later course of the war to what is strategic bombing, the bombing of cities would have been defined as a war crime and the German's responsible for it would have been tried at Neuremburg and hanged.

I still remember very vividly when our first news reached us but we heard rumors that we were attacking the cities of Japan with jellied gasoline bombs. I was at that time working on the uranium project at the University of Chicago and the response to the news among that scientists is still fresh in my memory. There was no statement issued by the government at that time announcing the adoption of this type of warfare, and there was also no attempt made to explain to the government the justification for it. Gradually the news of this type of warfare gradually transpired through the newspapers and gradually the people were accustomed to hearing about it.

When the atomic bomb became available for use, the war against Germany had already been won and Japan was essentially defeated. In the circumstances there was a strong sentiment among scientists of the Chicago laboratory against the contemplated use of the bomb. A memorandum sent to the Secretary of War expressed these misgivings and when it became clear that considerations of expediency ~~which~~ would carry the day, a petition against the use of this bomb was sent to the President. I do not wish to place too much emphasis on this, however, for what concerns us here is not whether moral considerations find expression in statements issued by scientists. What concerns us here is whether moral considerations influence their actions.

These actions are not necessarily determined by conscious considerations. The work of the scientists involves his heart as much as it involves his mind. Everybody knew both in his heart and in his mind that the bombing of Rotterdam was ~~xxx~~ wrong even though it may have had some justification from the point of view of expediency. There are arguments of expediency that can be cited in defense of the bombing of Hiroshima and there are some scientists whose minds are susceptible to these arguments. But the heart has a logic of its own and most scientists know in their heart today that Hiroshima was wrong just as they knew that Rotterdam was wrong. Somehow scientists have come to distrust the government. What they distrust is the government's ability to exercise the

Perhaps if things have to be put in words perhaps we can come closer to the truth if things have to be put into words. Perhaps one could say that scientists have come. There are no adequate words to describe the state of a heart. But perhaps we come closest to the truth if we can say that Hitler~~xx~~ planted suspicion in the heart of the scientists. A government which has great