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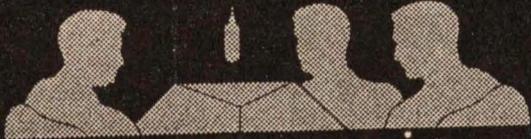
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Atomic Bomb-Burst Over Japan.

THE UNIVERSITY OF CHICAGO



ROUND TABLE

THE ATOM AND
WORLD POLITICS

A Radio Discussion by NORMAN COUSINS
WILLIAM FOX, WILLIAM HOCKING *and*
LEO SZILARD

604TH BROADCAST IN COOPERATION WITH
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Around the Round Table



NORMAN COUSINS, editor of the *Saturday Review of Literature*, was born in New Jersey and attended Teachers College, Columbia University. Mr. Cousins was an editorial writer on the *New York Post* from 1934 until he joined the staff of *Current History* magazine in 1935, where he served as literary and managing editor. In 1940 he became executive editor of the *Saturday Review of Literature*, and he has been the editor since 1942. During the war he acted as publication consultant and editor of *U.S.A.* for the Office of War Information. He is the author of *The Good Inheritance* (1941) and *The Democratic Chance* (1942) and the editor of *A Treasury of Democracy* (1941) and *An Anthology of the Poetry of Liberty* (1943).



WILLIAM FOX, research associate at the Institute of International Studies at Yale University, received his B.S. degree at Haverford College and his M.A. and Ph.D. degrees at the University of Chicago. He served as an instructor in political science at Temple University and was later at Princeton University. He joined the Yale Institute in 1943. At the San Francisco Conference on International Organization he served as the secretary of the Committee on Enforcement Arrangements. He has contributed articles to various professional journals and is the author of *The Super Powers* (1944).



WILLIAM ERNEST HOCKING, Alford Professor Emeritus of Philosophy at Harvard University, has been associated with the Harvard University faculty since 1914. Before that time he had taught at Yale University and the University of California. He has also served as a visiting lecturer in many other universities in the United States and abroad. He is the author of many books, among which are: *The Meaning of God in Human Experience* (1912); *Man and the State* (1926); *The Philosophy of Law and Rights* (1926); *Types of Philosophy* (1929); *Science, Value, and Religion* (1942); *What Man Can Make of Man* (1942); and *Contemporary Science and the Idea of God* (1944).



LEO SZILARD, a member of the Metallurgical Laboratory at the University of Chicago, was active in research work in the development of the atomic bomb. He was born in Budapest, Hungary, and he studied in Germany. In 1922 he received his doctorate of philosophy at the University of Berlin, where he specialized in physics. Recently, he was a fellow of the American Physical Society.

THE ATOM AND WORLD POLITICS



MR. FOX: In the words of President Truman, the atomic bomb is too dangerous to be "loose in a lawless world."

No one could state more eloquently than you have already stated, Cousins, in your article in the *Saturday Review of Literature*, "Modern Man Is Obsolete," the awful urgency of the problem posed by the bomb.¹

MR. COUSINS: I am a layman; I am not a scientist; I cannot talk about this from any firsthand scientific knowledge. But I can speak as a layman and tell you of my own concern. I feel that the world is in grave peril today. I feel that this peril is not less than the world knew after Pearl Harbor, after Stalingrad, after Dunkirk, after every great crisis in the last ten years.

But the crisis today has become universal; it affects all the peoples of the world. I hope that, when President Truman reports to Congress and to the American people, he will recognize that the American people are ready to be told the truth. I trust that he will recognize that the American people are grown up and that they can be told the full implications of a destructive atomic energy and what is required in the way of international control to keep the atomic bomb from destroying mankind.

MR. FOX: You are a pioneer in nuclear physics, Szilard, and can speak better than the rest of us on the facts of our present danger.

MR. SZILARD: I take it that you would like to hear from me how long it would take another nation to have atomic bombs available and ready to drop on our cities. I am afraid that I am going to disappoint you if you expect me to give you what you might call the "inside dope." Of course, I should be glad to oblige, but someone might be listening to our conversation.

Let me remind you, therefore, that Churchill has taken a stand on this question. He said that the world has three years to put its house in order. I propose that we accept Mr. Churchill's statement as a basis of our discussion today.²

¹ See Norman Cousins, "Modern Man Is Obsolete," *Saturday Review of Literature*, August 18, 1945.

² Former Prime Minister Churchill, in a statement issued by Prime Minister Attlee on August 6, 1945, said, in part: "... The revelation of the secrets of nature long mer-

MR. FOX: The next question for today, then, is how the atomic bomb changes the problem which President Truman, Marshal Stalin, and Prime Minister Attlee have to face. How does the invention and use of the atomic bomb seem to affect the course of world politics?

MR. HOCKING: I should say that nothing in politics remains unchanged. I will mention a few points that occur to me now. The first is that the whole picture of security has altered. We have been seeking security, but what we have got is universal insecurity. No strategic boundaries are good. Armies and navies are such now that one bomb could destroy them.

In the second place, there is a new alignment of power in the world. At present it takes a great power to make a bomb, so that the great have become greater; and the small have become smaller. But some of the lesser powers may make the bomb. Canada, Belgium, and Czechoslovakia have uranium ores and science. The world will be divided upon a new division of the "haves" and "have-nots," which will mean having the bomb and not having it. Thereby all backward peoples have become more hopelessly outclassed in terms of power.

Again, a new type of pacifism has been sweeping the world with a demand that there shall be no more war. As the *Chicago Tribune* has put it, war has passed from irrationality to idiocy. There is a new drive for solutions other than for moral equivalents of war.

Further, there is a new argument for democracy—a discount on all heady leaders who might use the bomb.

And, finally, there is a new pressure toward world government; and at the same time world government becomes increasingly intolerable. Compulsory cooperation, without agreement of mind and conscience, is something which we cannot face without dismay.

MR. FOX: Is everybody as pessimistic as Mr. Churchill in believing that we have only three years to meet the problem posed by the bomb?

MR. SZILARD: No, there are some people who believe that it will take at least ten years until a potential enemy of the United States could have large quantities

cifully withheld from man should arouse the most solemn reflections in the mind and conscience of every human being capable of comprehension. We must indeed pray that these awful agencies will be made to conduce to peace among the nations and that instead of wreaking measureless havoc upon the entire globe they may become a perennial foundation of world prosperity" (*New York Herald Tribune*, August 7, 1945).

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of atomic bombs. I am not a prophet, and, for all I know, they may be right. But the arguments which they use to support their optimistic prophecy, I am sure, are wrong. They say, for instance, that other nations do not know how to make atomic bombs. But if one takes, for instance, the official release of the War Department, called the Smyth Report, one will see that we have told other nations along what road they have to move in order to reach the goal. Any organized group of scientists who move along this road will, step by step, discover what we have discovered and obtain the results which we have obtained.³

MR. COUSINS: That is a very good observation. Another interesting thing about the Smyth Report, you will recall, is that it mentioned that there were three separate experiments being conducted for the utilization of atomic energy. All three experiments were conducted independently. No one branch knew what the others were doing, and yet all three experiments came out successfully. We, therefore, have no right to assume that other nations are less smart than we are. Other nations have their scientists. So long as the mind can work anywhere in the world, there is the possibility, perhaps now the probability, that this device will be perfected.

MR. FOX: I suppose that we could agree that the new atomic weapons offer the great nations of the world the nearer certainty that each other's major cities, and civilian populations living within those cities, will be destroyed in the first hours of another war, if that war should unhappily occur. This gives a new urgency to the task of fashioning a durable peace, but perhaps it also gives new hope that the task can be done.

MR. COUSINS: Despite my seeming pessimism, I really am an optimist, because I have a great hope and a great faith in the peoples of the world. I think that, once the peoples of the world are acquainted with the danger—the extent and the imminency of the peril—which confronts them, they will move instinctively toward the type of control without which we will not be able to have world peace.

MR. HOCKING: The moving in that direction mentally is unquestionably, I believe, what is being done all over the world today. Whether we reach the point of world government I am doubtful.

MR. COUSINS: I am rather doubtful about it too. I do not think that world government will spring into being overnight, but I do think that there may be reasons for world government and that there may be a need for world govern-

³ See Waldemar Kaempffert's discussion of the Smyth Report (a 30,000-word report prepared by Professor H. D. Smyth of Princeton University and released by the War Department as a tract on the atomic bomb) in the *New York Times* on August 16, 1945 (page 8), for an excellent summary account of the development of the atomic bomb.

ment. The question before us is when we will be faced by this need. Will it face us three years from now; ten years from now; twenty years from now? Does it face us right away? If that need exists, let us work toward meeting it; let us work toward a campaign of public education so that people can realize finally that the time has come in the history of mankind when each person must grow up, become a world citizen, and develop a world conscience.

MR. SZILARD: If we all agree that we cannot have world government within the three years specified by Mr. Churchill (even though that is the only solution for permanent peace), we are faced with the question of what to do right now to get at least a durable peace.

I do not believe that an armed peace, in which rival nations pile up large stocks of atomic bombs, can be a durable peace. We need some sort of an agreement which will give us assurance that, so long as that agreement exists, there will be no violation of the agreement—that is, there will be no stocks of atomic bombs; there will be no manufacture of atomic bombs; and, if there are violations, that they will be detected and will become known to the world.

MR. COUSINS: I am afraid of agreements which may be made in a vacuum. Agreements, after all, must be binding. In order to be binding, they must have force behind them. In order to have force behind them, we must have central control and central administration. We must, in short, have government. I wonder whether we can have any agreements which are binding without government. Has it ever been done in the history of the world?

MR. HOCKING: Would you give us that little series of steps which you have mentioned before—the necessity of power and law to control?

MR. COUSINS: It perhaps goes somewhat like this: We are all agreed (certainly I have heard no disagreement here or elsewhere) that we do need control of the atomic bomb. Nor have I heard anyone say that we can have control without power. We need power in order to have control; but power is unthinkable—it is unconscionable—without law.

I would like to ask whether we can have law without government if that law is to be effective. I do not mean law that can be invoked once every so often, but law which will work and which will work for keeps and banish war.

MR. HOCKING: I should say that we can have law without government and that we can have power without law. Power without law is undesirable, but law without government has existed.

MR. COUSINS: As national government or as a national organization?

MR. HOCKING: As a matter of fact, international law has led a checkered existence for three hundred years, but it has grown in influence and in demand

THE ATOMIC "SOLAR SYSTEM"

1. ATOM PARTS

In Nucleus

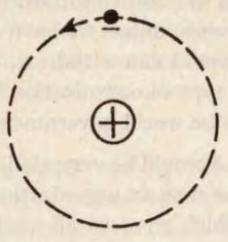
-  PROTON, Mass=1
Electrical charge = +1
-  NEUTRON, Mass=1
Electrical charge = 0

In Outer Orbit

-  ELECTRON, Mass=0*
-  Electrical charge = -1

*Actually $\frac{1}{1850}$ of Proton weight

2. SIMPLEST ATOM



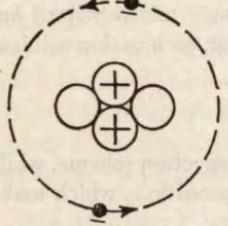
One electron
Mass 0
Charge -1

One Proton
Mass 1
Charge +1

HYDROGEN

Atom weight=1 Atom number=1

3. TYPICAL ATOM



Two electrons
Mass 0
Charge -2

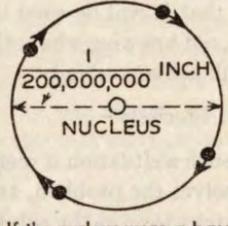
Two Protons
Mass 2
Charge +2

Two Neutrons
Mass 2
Charge 0

HELIUM

Atom weight=4 Atom number=2

4. ATOM SIZE



ELECTRON

Most of an atom is mere space

If the nucleus were a baseball, the electron would be a speck 2,000 ft. away

Source: "How Atom Splitting Releases Energy." *Business Week*, September 1, 1945

even though the actual power behind it has never been great enough to enforce it.

MR. SZILARD: I would admit that if we obtain an agreement, as I outlined it, we shall have to provide for inspection of factories and mining operations, but that all we could hope for would be that violations would be detected and become known to the world. We could not prevent, I believe, at present, any great power from abrogating that agreement. Do you think that there is any way of preventing a great power from abrogating such an agreement?

MR. FOX: Certainly not, so long as the world chooses to regulate its international affairs with the aid of such organizations as that created at San Francisco last spring.

MR. COUSINS: This brings us to the crux of the discussion. If we are going to have an inspection agreement, how can that inspection agreement operate unless

the states which agree to participate in that inspection service will waive the right to secede and give up the right to withdraw from any central organization? The League of Nations, we know, was ineffective, because at the moment a crisis came Japan was able to withdraw or Germany was able to withdraw. When the next crisis comes, unless we have a form of international organization from which no government can withdraw, that organization will be a failure. But if you do have the type of organization from which no state can secede, then that organization will be world government.

MR. SZILARD: I would be very glad if we could have such an organization, but if we cannot have such an organization, the situation is not hopeless. If we had an agreement which gave us all assurance that violations of the agreements would be detected, we would not fear a sudden attack by atomic bombs, because there would be no atomic bombs in existence. We would at least avoid the danger of a war arising out of an armament race or arising out of fear of a sudden attack.

MR. FOX: Certainly the danger posed by the bomb is twofold. There is not only the danger that it will be used but there is the danger which Szilard has pointed out that, not knowing what other nations are doing, each nation will fear the worst and will act accordingly.

MR. COUSINS: Precisely!

MR. FOX: In such a situation it seems to me that an inspection scheme, while it by no means solves the problem, at least creates the conditions which make possible second steps toward the solution of the problem.

MR. SZILARD: I would agree with you to some extent, but I believe that inspection alone is not enough. If we want to be assured that no moves are made toward manufacturing atomic bombs, we must go beyond inspection. We cannot rely upon the reports from agents of some international authority which would roam across the countryside; we can have assurance only if somehow we can obtain the cooperation of the native engineers and scientists. If we could rely upon them, or at least upon a certain percentage of them, they would serve to report violations of the agreement to some international authority.

MR. COUSINS: I am glad to hear you say that, because the violations of the use of atomic energy in themselves must be considered only in relation to the causes of war. Unless we do something about eliminating the causes of war, those violations will take place.

The basic cause for war in the modern world, I think you will agree, is that the world today is a geographic unit in the same way in which the Greek states were a geographic unit and in the same way in which the American states were a geographic unit, one hundred and sixty years ago. And that fact poses the problem, as Madison pointed out in the *Federalist*, that states within a geographic

unit must unite or fight. Now we belong to a world unit, but the world unit is unorganized so long as it remains in the present status. So long as all peoples and all nations have direct accessibility to each other for purposes of war, we will not be able to avoid war. Therefore, we are led, as I say again, to the strongest possible type of international organization. We need something in the field of international organization that is as powerful as the atomic bomb. The only thing which can be as powerful as the atomic bomb is the ultimate in organization, which is government.

MR. FOX: Of course, we are not going to get world government simply by convincing men of good will in the United States that world government is necessary. The will for world government must be pretty evenly spread all around the world in order to have world government achieved in the only way in which we want to achieve it—namely, by general voluntary consent.

MR. HOCKING: The problem of world government seems to reduce itself to this: There can be no power greater than the atomic bomb except the atomic bomb. In other words, world government must have a monopoly of the bomb if it is to be world government, for if it had the bomb and if we had the bomb, there would still be two independent powers, each of which was as strong as the other. Therefore, the alternatives are that we vest all our political power in one agency and resign that power ourselves or else that we cease to coerce independent states through use of the atomic bomb.

MR. SZILARD: If we can obtain what Professor Hocking proposes right now, I am all in favor of it. But if we cannot obtain it right now, we must examine what we can do right now. The type of agreement which I outlined might be quite satisfactory, but we must not forget to examine what will happen if, in the absence of a world government or world authority, a great power abrogates this agreement. This is a question which we have to examine.

Presumably five or ten years from now we will have atomic power plants erected on the territory of various nations, particularly if we help other nations to get into this field. Now, if this agreement is abrogated, the nations immediately will start to convert their atomic power plants for the manufacture of atomic bombs. The question will have to be examined of what restrictions have we to impose upon atomic power plants to make sure that, from the time when conversion starts, a time lag of perhaps a year should elapse before atomic bombs become available and ready for an attack.

MR. FOX: What sorts of restrictions would that actually impose on the free conduct of states?

MR. SZILARD: I am afraid that that leads into technical questions which we will not be able to discuss here.

MR. COUSINS: How would you bring these restrictions into operation? What authority would you have behind these restrictions? Who would operate them? After all, you are now talking about the highest and the most complicated type of regulation in the world—one requiring the most power. What would be the source of that power? By agreement? Agreement based upon what?

MR. SZILARD: I believe that Fox is in a better position to answer this question than I am.

MR. FOX: The chief sanction for such an agreement is the prospect of what would follow the early discovery of a violation by one of the powers of agreements which had been made not to make preparations to manufacture the bomb, for such early discovery would inevitably bring into being a grand coalition against the violator, which, I think, would make it very unlikely to want to proceed to commit that violation.

MR. HOCKING: So long as we are meeting force with force, we are accepting the general argument that there will be another contest of force. Would there not also be some possibility of evading these situations if we could look on the positive side of the new sources of energy opened up by nuclear physics? Perhaps these new sources of energy would be pertinent to those very causes of war—the economic causes—which have been so fertile in creating conflict.

MR. FOX: Let us hope so. But, in the meantime, let us examine some of the things which we as Americans may want to do besides work for international agreement.

MR. SZILARD: I share your optimism that if we had an agreement which gave us and other nations an assurance that no atomic bombs would be made, there would be a good chance that that agreement would last for a long time. In spite of this, I do not believe that we can neglect the possibility of an abrogation of that agreement.

In the United States, thirty million people live in cities of over two hundred and fifty thousand.⁴ One year after the agreement is abrogated, atomic bombs may be available in such a quantity that all these cities could be destroyed in one single, sudden attack.

The question thus arises whether we should not begin to think about the possibility of relocating thirty to sixty million people. If we had to do this relocation during an armament race and in a hurry, it would be a terrible burden upon our economy. But if we can do it on the basis of a ten-year plan, during peacetime, when we do not fear a sudden attack, it would cost us perhaps fifteen billion

⁴ In 1940 about sixteen million people lived in cities having a population of one million or more residents; almost fifteen million lived in towns of 25,000 to 100,000 inhabitants; and about twelve million lived in towns of 2,500 to 10,000.

dollars. That sum would be a tolerable burden, for my economist friends say that it would not reduce the standard of living appreciably during this transition period.

MR. FOX: You mean fifteen billion dollars per year for the whole transition period?

MR. SZILARD: That is right. That sum would mean that the total volume of the construction industry need not be expanded beyond its volume during the peak year in 1942.

MR. FOX: Would that give us protection against all kinds of weapons—not only those which we experienced in this recent war but those which we are likely to experience in the next war, if it should come?

MR. SZILARD: If you take the relocation of the population alone, without thinking of other methods to produce peace, I would say that in the long run these would offer us no protection. You probably saw that Dr. Oliphant said in England that he looks forward to bombs which correspond to a million and ten million tons of TNT. That would be a thousand to ten thousand times larger than bombs which we used over Japan. That would mean that the actual radius of such a bomb hit would be about ten miles.⁵

But even if we forget possible further developments of atomic bombs, there are methods of extermination of human beings, or there may be within the next five or ten years, against which the dissolution of our cities would offer no protection. Biological warfare—biochemical warfare—has so far not been seriously considered. I believe that the reason for this is the moral inhibition which most scientists feel when they think of these methods. I am not sure that we can count on such a moral inhibition any longer.

MR. FOX: Where do you think this discussion leads us, Hocking?

MR. HOCKING: It leads us to the question of whether these moral inhibitions are still capable of development. I feel very strongly that the peace to which men are driven by fear is not peace; that we must not act in a panic. The more the danger, the more steadiness is called for.

World government, which vests power in one central agency, is a step hard to undo. This side of that step, much can be done by *ad hoc* administration on the

⁵ In the House of Representatives on September 24, 1945, Representative Arends of Illinois declared: "I am advised on the most competent authority that our scientists and technicians have now created atomic bombs of such prodigious and multiplied destructive power that the explosion which killed 150,000 humans and obliterated the city of Hiroshima was only a small firecracker by comparison" (*Chicago Sun*, September 25, 1945).

basis of consent, beginning with agreements to outlaw the use of the bomb. Bertrand Russell does not believe sovereignty will be surrendered, on the ground, as he puts it, that 90 per cent of mankind would rather be dead than sensible. Sovereignty, however, will be surrendered to some extent, and 90 per cent of mankind would rather be dead than in needless chains.

Few men, as a matter of fact, are uneasy over the present temporary monopoly by the United States. Disagreements in London have not been noticeably less outspoken than before. But most men, who think about it, are aware of their own unreadiness and our national unreadiness to be trusted with omnipotence; and even atomic wars cannot be carried on without involving the consent of peoples. They will, therefore, prefer to approach world government slowly and, meantime, to build up the moral bases of control—first of all, by strengthening law; second, by concrete cooperation where a war might be starting; and, third, by exploring the relieving effects of a new economy of abundance which is made possible by atomic energy.

This country should not hasten to surrender its momentary monopoly but should use the moment to build a common mind.

MR. COUSINS: I fully agree with the difficulty of obtaining world government. I also recognize, I hope, the consequences of our failure to achieve world government. I do not think that we can achieve the benefits of world government (we all want the benefits) without actually having world government. I do not think that world government is a cure-all, but I do think that it is a minimum step and not a maximum step. Only world government can give us the time we need in which to work out these problems, because time is now running out.

Man today is similar to a person who is at the edge of a canyon with a forest fire raging behind him. He cannot retreat; he cannot go forward, because there is a sheer drop of several thousand feet, but (and this is a big "but" even though the canyon is only ten feet wide) if he can jump across that canyon, he can make the other side. It so may happen that this particular person may never have been able to jump ten feet before. There is nothing in his experience to indicate that he can jump ten feet, and yet the longer he waits the less space he will have in which to make that running leap. So, the thing for him to do is to make the leap right away, just as fast as he can.

I agree with Hocking that we must not become panicky. On the other hand, unless we recognize the nature and the imminency of the peril, fire will creep up on us, and we will have to jump from a standing position, or perhaps we may have to try to step across.

What is called for, perhaps, is a program of public education—education about the things which we have been discussing today and about the possibilities of real cooperation—the possibilities of world citizenship.

MR. FOX: I hope that we will also have an opportunity for a quick job of bridge-building and not have to jump.

All four of us have, I think, agreed that only a fundamental political reorganization of the world can bring absolute protection to the American people and to the world against the hazard of the atomic bomb.

Cousins wants no half-measures but wants to begin with world government within a very short time and follow with whatever else then appears to be necessary. Hocking, Szilard, and I would tend to agree that world government is not a short-run possibility and that absolute protection is not possible. We believe that we are confronted with choosing our policy from among a variety of imperfect, though not equally imperfect, alternatives. We agree that a proper first step is to ask for an efficient international inspection system. We hope that, with general confidence in the inspection system, it will become feasible and essential that states agree not only to outlaw the use of the bomb but to destroy existing stock piles and atomic-energy installations designed for bomb manufacture.



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What Do *You* Think?

1. Assuming that the United States has three years' time to maintain its monopoly upon the atomic bomb, what policy do you think should be pursued during that period? What are the responsibilities of this country? Should we give away the secret? To the United Nations? Would publishing it put an end to armament races? Should we try to forget it? Discuss.
2. What should be the long-run goals of United States policy? Should we look toward world government? Can we have stable world government within the next three years? Will fear of the atomic bomb prevent war? Will it mean real peace? Should we use our knowledge of this weapon as a bargaining power in world affairs? Discuss.
3. Do you think that the advance of technical knowledge has increased the urgency of the obligation of men to their fellow-men? Does this stop at national borders? Do you think that the possession of the atomic bomb has increased the moral responsibility of this country? Do you think that the United States can make a plea against its future use after using it against Japan? Once at war, is there a real distinction between using one kind of weapon and another?
4. Do you favor the immediate establishment of a system of world government which will decide policy as necessity demands? Or would you prefer more gradual steps toward the eventual establishment of a real world government? If so, what interim policy do you favor in relation to control of the atomic bomb?
5. What do you consider the primary requisites for the achievement of a world community? Do you think that there is now a basis of moral responsibility which may bind us to our neighbors for common goals? Do you agree that "90 per cent of mankind would rather be dead than sensible"? Outline the bases upon which you believe a world government could be maintained.
6. What is the history of the influence of important inventions upon society—its social and economic institutions and its ideologies? What are the social "resistances" which might cause the potentialities of the use of atomic energy to develop slowly? Do you think that we should dissolve our cities? Go underground? Would this be a real protection?
7. It has been said that "any association which helps to carry out the true ends of government is not in opposition to the nation." Discuss this statement with regard to the future of international organization.



More on This Topic

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Interim Control of Atom Bomb Pending World Set-Up Is Urged

To Guarantee Survival While Global Organization Is Being Negotiated, English-Speaking Lands Must Begin Own Defensive Measures

By Major George Fielding Eliot

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(This is the second of two articles on the atomic bomb.)

More sober second thoughts on the atomic bomb: In Sunday's article it was pointed out that the problem of protecting mankind from the atomic bomb may be divided into two parts: protection against its use by an underground

gang or a power-mad lunatic group which might get control of a small country, and protection against its use by a great power against another great power. Security in the first case may for the time being rest on a world-wide intelligence service, possibly a pooling of information by the secret services of all great powers through the medium of the Security Council—but certainly this must include the work of a first-class American intelligence organization. Security in the second case may in part rest on the fact that reprisals are certain unless the intended victim can be completely wiped out in the first surprise attacks—and it was suggested that as against a great industrial and military nation such as the United States, or rather the Anglo-American combination, it would be difficult indeed to make preparations on sufficient scale to do this without giving notice in advance of the intention.

But is this enough? What of the proposed international control of atomic energy, to harness it for the good of mankind and prevent its use for mankind's destruction?

It seems to this writer that we must move toward this end, but that we must be very sure that when we set up such control it will work. This problem, too, may be divided into two parts: How are we going to set up such controls and make them work—and how are we going to survive in the mean while?

Expects Some Delay

It is all very well to say that the urgency of the problem is such that we must do away with delays and obstructions and get on with the job of building a world state, or at least an international organization to which all states will transfer a sufficient degree of their precious sovereignty so that it may control the production and use of the more lethal types of modern armament, including the atomic bomb and also, of course, rockets, long-range-guided missiles and super-bombers. But a certain amount of experience with the intricacies of the political process on the international level suggests very strongly to this writer, at least, that it just is not going to be possible to get this job done quickly, or that if it is done quickly, perhaps under the pressure of eloquence or panic, it will not last. And it is submitted that it will be at least as dangerous to build up something that looks good and won't work as not to build at all.

There are certain steps that can and should be taken at once.

First, as Senator Brien McMahon, of Connecticut, and others have suggested, American use and development of atomic energy should be placed in the hands of the people, that is, of a government commission. There must be no private-enterprise nonsense about anything as dangerous as this.

Second, we should spell out our present agreement with the British and Canadians, under arrangements by which they will also put their atomic development under

government control, while the three of us agree among ourselves on certain rules and regulations, and make adequate preparation for widely dispersed and constantly vigilant defensive preparations—or rather, counter-offensive preparations.

Third, we should immediately propose to the other United Nations that they adhere to this agreement, so that there can be—if all agree—no possibility of atomic energy being used or developed except by governments.

Fourth, we should establish on a firm footing an efficient American intelligence service, reporting directly to the President and not to any one department of the government, and this service should have adequate scientific assistance. We should arrange to exchange information with the British and Canadians, and we should offer to exchange information with any other of the United Nations which may desire to enter into such an arrangement.

Suggests Special Agency

If all come in, then the information can be pooled in a special agency of the Security Council. But a condition of the exchange of information should be that all powers entering into the arrangement must agree that the agents of the Security Council may carry out such inspections of their military and industrial plant as may be directed by the council or its authorized agency, and that no power may interpose a veto against such inspections being made. Furthermore, all must agree that the development of atomic energy by private persons constitutes a criminal offense in which every other nation has an interest and which may properly be the subject of international concern.

When we have done all this—and these steps do not present very serious difficulties, require no derogation of sovereignty and are well within the framework of existing arrangements—then we have laid the foundation for a system of international control which we can thereafter proceed to work out. The problem of survival in the mean time is in great degree taken care of by the fact that the English-speaking group will be somewhat in the lead in development, and that it is to the last degree unlikely that any other power can make preparation on sufficient scale to wipe out the Anglo-Americans before they can hit back; so that the attempt must in itself be regarded as suicidal and therefore not to be undertaken. But what we must avoid above all things is to put our Anglo-American power of reprisal in a straitjacket of rules to which we will adhere but which others may not adhere to, until we have built carefully and tested thoroughly our system of international control. And we must avoid wishful thinking, the relaxation of vigilance, which might follow the writing down on paper of some hastily devised system of control which might in practice prove illusory.

House Group Bids U. S. Keep Bomb a Secret

Back From World Tour, Members Tell Truman Pacific Bases Are Vital

By Raymond J. Blair

WASHINGTON, Oct. 1.—President Truman was told today by a Congressional group home from a world tour that the United States should retain for the present the secret of the atomic bomb, keep former Japanese islands in the Pacific, and negotiate for bases on Allied islands which American forces occupied during the war.

A War Department subcommittee of the House Appropriations Committee made these suggestions during a White House visit. The group returned Sept. 23 from a thirty-nine-day inspection of United States military installations.

The subcommittee, which conferred with Generalissimo Chiang Kai-shek and other high Chinese leaders, told the President that China would welcome American economic and military missions.

The group asked also that tangible returns be obtained for surplus war stocks piled up in foreign countries. One member, Representative Albert J. Engel, Republican, of Michigan, estimated that there are 6,000,000 tons of surplus Army goods abroad, exclusive of lend-lease and Air Forces materials, and that the original cost of this material was between \$6,000,000,000 and \$8,000,000,000.

Asks a Special Commission

The subcommittee suggested to the President, who is preparing a message to Congress on the atomic bomb, that a commission be created at once to study "all phases of atomic power." The commission would be composed of the scientists who directed the project, the joint chiefs of staff, the State Department and Congress members. "Pending such study and its findings, we recommend against the release of the atomic secrets," the subcommittee said in a statement issued at the White House.

The House Rules Committee approved today for floor consideration a resolution to set up a twelve-man joint Congressional committee to study control of the bomb. The Senate recently approved such a resolution.

The appropriations subcommittee recommended to Mr. Truman that the war-built world network of airways, landing fields, and weather and traffic control facilities be conserved for private lines and that the Army and Navy transport services be consolidated; deplored a "worldwide tendency to regard the United States as a country of unlimited wealth"; recommended that current War Department appropriations be cut at least \$27,500,000,000 (President Truman has already recommended a \$28,000,000,000 cut); and said it was "essential" that demobilization be expedited. The War Department, members said, is sustaining a "loss of prestige" among troops abroad because of the slowness of demobilization.

Representative Engel said the group was told by General of the Army Dwight D. Eisenhower that 400,000 men would be sent home from Europe monthly, beginning this month. The Army said today that 202,000 men were discharged last week. Some 1,116,000 soldiers have been released to date on points.

Warns To Keep Up Research

In cutting War Department funds, the subcommittee warned, care should be taken to insure continuing research in jet propulsion, radar, rockets and atomic power.

The subcommittee's statement originally contained the names of islands which members thought should be retained or on which bases should be sought. However,

when the statement was given reporters, these names had been deleted. This was done, it was learned, after President Truman had agreed with members that publication of the names would embarrass the Administration. Members said they understood that negotiations for bases on Allied islands were in progress.

In other atomic developments, Representative Jerry Voorhis, Democrat, of California, urged Congress to heed scientists who say an international authority should control development of atomic energy; Representative Daniel A. Reed, Republican, of New York, argued that proposals to share the atomic secret were "internationalism run wild" and "appeasement run mad;" in New York, an unnamed Columbia University scientist who helped develop the atomic bomb was quoted as saying that chances were 1,000 to 1 against development of a defense against it; while, on the other hand, Dr. Walter R. G. Baker, president of the General Electric Company, said this country's defense against the bomb is the fact that it alone has the wealth and resources to produce the weapon.

Vast Key Plant in Tennessee a Development of Prewar Electromagnetic Method

PILOT FACTORY LEFT OUT

Prof. E. O. Lawrence, California Physicist, Led in Work on Means of Producing U-235

Following is the fifth of a number of articles by a staff member of THE NEW YORK TIMES who was detached for service with the War Department at its request to explain the atomic bomb to the lay public. He witnessed the first test of the bomb in New Mexico and, on a flight to Nagasaki, its actual use.

By WILLIAM L. LAURENCE

When the discovery of the tremendous potentialities of uranium 235 (U-235) as a vast new source of atomic energy, and as a potential military weapon of enormous destructive powers, was made in 1939, it appeared first as a mirage, a sort of scientific fata morgana, whereby nature chose to tantalize man.

By what Professor Enrico Fermi described at the time as the "innate cussedness of nature," U-235 was found inextricably mixed with ordinary uranium (U-238), of which it constituted only seven-tenths of 1 per cent. U-235 being as like U-238 as tweedledee to tweedledee, the two could not be separated except in sub-microscopic amounts.

There were so many completely unknown phases of the possible methods for producing U-235 that it was decided, in December, 1942, to proceed toward the construction of several major plants, each for the development of a special method of production. It was thought at the time that at least one of the methods would develop insurmountable difficulties that would necessitate its abandonment, and it was not considered wise to put all our eggs into one basket.

As it turned out, however, while great difficulties were encountered they were all surmounted one by one, and no one method developed such a superiority over the others as to justify their abandonment.

One of these methods, known as the electromagnetic method, is based on the principle that electrically charged atoms (ions) describe a curved path as they move through a magnetic field. Atoms of different mass and the same electric charge, when moving with the same speed through the magnetic field, follow different circles, and the path of the heavier atoms has a longer radius than the path of the lighter atoms.

The atoms are most separated after traversing half of their respective circles, at which point they are collected in specially designed containers.

The Pre-War Mass Spectrometer

The pre-war apparatus for the separating of light from heavy atoms by the electromagnetic method was known as a mass spectrometer. It consisted of four principal parts: A source for the production and acceleration of ions; collectors in which the separated ions are deposited; a large magnet to make the atoms follow a curved path, and a tube, chamber, or tank, pumped down to low pressure, in which the particles (ions) travel from the source to the collector.

The tank is placed between the pole faces of the magnet.

Solid or liquid compounds containing the atoms to be separated must first be vaporized by the application of heat. The ions to be separated are produced in the source by an electric arc running through the vapor.

They are then accelerated by a high voltage system and made to travel at constant speed along curved paths in the magnetic field. Upon arrival at the collectors the ions are neutralized, i. e., they give up their electric charge, and solid material is deposited.

A high vacuum must be maintained in the tank in which the ions travel to reduce the number of gas molecules present, as when the ions collide with gas molecules they are deflected from their path, resulting in less material being col-

lected and greater contamination of the material.

The pre-war vintage of this apparatus consisted of a small magnet and a vacuum tube about three feet long. It would have required about 15,000,000 of them to produce at the rate of 2 pounds of U-235 a year.

This midget has been metamorphosed into a giant plant covering 500 acres. Instead of sub-microscopic amounts it turns out U-235 on a mass-production basis.

Credit for this remarkable transmutation of a laboratory toy into a giant industrial plant in an incredibly short time is largely due to Professor Ernest O. Lawrence of the University of California, one of the world's outstanding experimental physicists, who won the Nobel Prize for his invention and development of the cyclotron, atomic "slingshot."

Basis of Prof. Lawrence's Work

It was generally believed that the electromagnetic method had some serious limitations to make it practical for large-scale separation of U-235. Dr. Lawrence, however, was not convinced that the indicated limitations were insurmountable. In November, 1941, without any financial assistance from any government agency, he proceeded to rip his 37-inch cyclotron apart and put its 85-ton magnet to use in a giant mass spectrometer.

Within three months he had produced a relatively enormous amount, which was thousands of times greater than had ever been concentrated before, and at a ten times faster rate. This quantity was sufficient to be useful in determining the properties of the material and to demonstrate that the electromagnetic method of separation held possibilities of ultimate success.

During the course of this preliminary work the Research Corporation made a grant of \$5,000 to the University of California Radiation Laboratory, directed by Dr. Lawrence. In December, 1941, the National Defense Research Committee, headed by President James Bryant Conant of Harvard, offered a Government contract to underwrite this phase of the research, and the grant from the Research Corporation was returned.

After the preparation of the first sample, experiments were pushed day and night to increase the output of the equipment. By March, 1942, alterations had raised the production rate for short periods by a factor of 500.

By May 26, 1942, the great 184-inch magnet, largest of its kind in the world, was turned on for the first time on the concentration of U-235. Its completion as the world's largest cyclotron had been indefinitely postponed some months previously in favor of its conversion into a giant mass spectrometer, the greatest by far ever built. The Rockefeller Foundation made a grant of \$60,000 for the conversion, as a contribution to the

Atomic Isolationism

A debate has been going on in Congress and the press over whether America should cling to its unique possession of the secret of the atomic bomb as long as possible; or whether we should share it with the United Nations and try to create an international body capable of controlling it.

Of course, atom-splitting itself is not a secret. Atomic fission was discovered through the contributions of international scientists working in Copenhagen, Berlin, Manhattan, Princeton. Now that it has been discovered, it is no more national or secret than the principles of radio or flight.

We possess only mechanical secrets about how to harness atomic energy in a bomb. We cannot keep a monopoly of know-how for long. Other nations will work it out for themselves in the immediate future.

Therefore, we are not making a decision about whether or not to give away the secret of the atomic bomb, since it is not possible to keep it.

We are making quite a different decision. We cannot keep the atomic bomb from being known, but we must decide what we will do to keep it from being used.

Once more, and this time on the most terrible of all issues, we must decide whether to entrust our survival to isolationism or internationalism. Our advance possession of the atomic bomb means that we have a little time, not very much, in which to act.

NEW YORK, TUESDAY, OCTOBER 2, 1945. NY Post

Feb. 3, 1943, and the first units were placed in operation Jan. 27, 1944. It has hundreds of buildings of a permanent nature. Its operating personnel totals more than 20,000.

Building the Tennessee plant involved problems of construction and design never encountered before, since it is the first and only one of its kind in the world, and there was no time even to construct a small pilot plant that could have served as a model.

Unique Equipment Provided

Since the electrified atoms to be separated must travel in a very high vacuum, high-speed vacuum pumps such as never existed before had to be created. After much research Distillation Products Company developed pumps that produce and maintain extremely low atmospheric pressures. No vacuum pumps capable of operating at such high speeds and such low pressures are commercially in use in any other process.

Great difficulties also had to be overcome in designing extremely delicate control equipment for high voltage current. Rectifier units had to be designed capable of supplying a certain amperage at a very high voltage. These requirements are far above those encountered in radio broadcasting and similar high-voltage power applications.

The requirements in the process for separating the uranium atoms limit the maximum permissible variation in the value of high voltage supplied to the apparatus to approximately 0.04 per cent of the mean voltage. Such precise regulation of high amounts of power at high voltages, to a load that intermittently acts as a short circuit, had never before been attained.

Because of the great scarcity of copper, and because time was more precious than gold, 27,850,000 pounds of silver, worth \$400,000,000, were borrowed from the Treasury Department for use as winding coils and busbars for the multitudinous magnets. The solid silver winding coils have a total length of more than 900 miles.

Silver is as good a conductor of electricity as copper and is not harmed by the passage of current. The silver will be returned to the Treasury when conditions warrant. Meantime this great plant for producing the material for the atomic bomb is, among other things, also a "branch office of the Treasury."

All the research involving the electromagnetic method for concentrating U-235 was carried out under Government contract at the University of California under the direction of Professor Lawrence. At the peak of the research, August, 1943, Dr. Lawrence was assisted by a staff of 1,266, including 465 laboratory and research workers, and 365 employed in plant operation.

Additional articles by Mr. Lawrence will appear in early issues.

MORE CONGRESSMEN FOR SECRECY ON BOMB

North American Newspaper Alliance.

WASHINGTON, Sept. 30—Clear party division was noted in an analysis of eighty-six Congressional replies to a telegram sent members of both Houses by North American Newspaper Alliance asking for a fifty-word opinion on "whether the atomic-bomb secret should be given Russia and why." An overwhelming majority, however, opposed giving the secret to any foreign country.

Of the eighty-six replies, forty-seven Democratic and thirty-nine Republican, received, all the Republicans and thirty-seven Democrats were against divulging the secret of the atom bomb to any country, the greater part mentioning the Soviet Union specifically. And among those opposed, approximately equal party groups, eleven Democrats and ten Republicans qualified their opposition.

But seven Democrats registered no primary objection to divulging the secret, and of these a majority view of five urged United Nations control of the bomb secret or at least placing such bombs at the disposition of an international police force administered by the United Nations Organization.

Honor Columbia on Atom Bomb

OAK RIDGE, Tenn., Sept. 30 (AP)—Columbia University will receive a certificate, signed by the Secretary of War, in recognition of its part in the development of the atomic bomb. The award will be made Oct. 4. Army-Navy "E" flags in connection with work on the atomic bomb will be awarded to the Hooker Electro-Chemical Company of Niagara Falls, N. Y., Oct. 2, and the Electro-Metallurgy Company of Buffalo, Oct. 5.

TODAY and TOMORROW

By WALTER LIPPMANN

HT The Atomic Secret 10/2

AMONG those who know the secret of the atomic bomb, there does not seem to be any one who thinks it can remain a secret very long. Mr. Churchill, for example, must have been speaking for the British scientists who know the secret when he said that it could be kept not longer than four or five years. A very large number of the American scientists who worked on the bomb are on record as believing that "we can claim no enduring monopoly in the possession of the atomic bomb."

They ought to know, and if the secret cannot be kept, it is unnecessary to argue whether it ought to be kept. Moreover, it would be in the highest degree dangerous to suppose we were keeping the secret if in fact we were not. For that could only give us, as it has already given many, a false sense of security and a false sense of our own power.

This secret is now known to a certain number of scientific men in Great Britain, Canada, and the United States. No one could, I imagine, say exactly how many they are, whether there are fifty men or five hundred who possess the knowledge which other scientists and inventors do not as yet have. Let us suppose that the British, the Canadian, and the United States governments were to bind each of these scientists to keep the secret. How could this be done? One way would be to lock the whole lot of them up in a concentration camp. Another might be to forbid them to do any research in any way connected with the atom. For if these men go back as free men to their laboratories, they are bound to use what they know in their researches. That in itself will soon provide their scientific colleagues throughout the world with all the clues they need to rediscover the secret.

It is impossible to imagine how scientific research in nuclear physics could be carried on in three countries without disclosing the secret. It is fantastic to suppose that a selected bit of knowledge in a vast field of knowledge could in time of peace be kept hidden within the national boundaries of three democratic countries. Even in war time and in spite of the secret police of totalitarian Germany, we managed to get wind of the secret of Germany's most secret weapons.

How, then, can we best protect mankind against the terrible possibilities of this new scientific knowledge? In the last analysis only by making the knowledge so universal that it would be impossible for any government to perfect in secret some new devilish application of it. The best international inspectors, the best international detectives—in fact the only competent inspectors and detectives—will be the scientists who work in this field.

The more of them there are in all countries, and the more they know, the more difficult it will be for any government to conceal the development of atomic weapons.

For when a man knows almost everything that is known about a subject, a small hint, a slight clue, will either give him the rest of it, or make him smell that something is being hidden which needs to be ferreted out.

The object of our policy cannot be to keep the secret. That cannot be done. Our object must be to prevent the secret use of the knowledge as a military surprise. We can hope to do this only by measures which make the knowledge so much the common property of the scientific world that scientists would quickly be alerted if any of their colleagues anywhere went underground to develop a weapon of surprise.

No form on international control can work if it is not based on the premise that the scientists themselves must be the detectives and inspectors of the control. If we start with that premise, then it follows that the international agreements should aid at the most prompt and detailed exchanges of scientific knowledge in the whole field of atomic energy. It ought to be quite feasible for the scientists who now have the secret to say what reports, correspondence, exchange of visits among laboratories, would make most certain that no development can long be carried on secretly.

It will be said that this is all very nice but how do we know that the Soviet Union, which is so secretive, would sign such a scientific treaty, or interpret it in the same spirit as we do. The answer, I believe, is that the wider we open this knowledge to the scientists of the world, the more nations we bring into the research, the more difficult it will become for any nation to isolate its own scientists and to conceal their work.

Even if not all the nations adhered to such a treaty, the nations which do adhere ought still to make all their knowledge common property. For they can best guard mankind against the use of atomic energy as a destructive surprise by multiplying the watchers and sentinels who already know so much that it is hard to surprise them. All the scientists of thirty or forty nations can afford much greater protection than a few hundred scientists in three nations. There will be more of them and they will be working in more parts of the world.

If, on the contrary we ourselves try to keep the secret, we shall not only instigate others to act in secret, but we shall also make it much easier for them to act in secret. For instead of alerting the scientific world so that it can alert governments and people, we should be closing the eyes and ears of the very men who can most quickly detect any hidden mischief that is being concocted in the dark.

To those who contend that we should guard this secret, we must, I believe, reply that, on the contrary, the safest course is to guard against its being a secret anywhere.

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N.Y. Post, 10/2



Edgar Mowrer On World Affairs

Time to Wake Up

By Edgar Ansel Mowrer

The brilliant scientists who split the atom out in New Mexico seem at the same time to have split the contemporary personality. Since then most of us have been suffering from divided personality.

This is not necessarily harmful. My puritan ancestors were at home in two worlds—a Sunday world in which they sang hymns and thought nobly about their fellow man; a week-day world in which they practiced business as usual and gypped the unwary.

It did not cause them any particular unhappiness. For both worlds were real.

Post-atomic schizophrenia is, however, downright dangerous. Not only do we flutter between reality and dream. We take the dream for the reality and persist in looking upon the new reality as a sort of dream.

In our dream world (which we treat as real) we go on just as before July 16, 1945. I do not mean merely that we are born, breathe, eat, sleep, marry and die just as people always have. We have no choice about these things. But we are concerned about all sorts of matters that have ceased to be important.

Worries Here and Everywhere

Elevatorsmen in New York strike for higher wages. Donald Wills Douglas worries about the future of the propeller-driven, gas-engine Douglas airplane. The President bothers about reconversion, Republicans about their failure to please the voter, Democrats about holding their jobs, Socialists about "economic planning," individualists about "private initiative."

Over in England some serious people are fretting lest the Labor cabinet fail to carry out its foreign policy. Frenchmen are losing sleep over the exact degree of collaborationist guilt of this monsieur or that demoiselle. King Ibn Saud chews his beard thinking about the next subsidy from Washington. Iranians cut each other's throats over a preference

for Russia. Marshal Tito fumes over his probable failure to pocket Italian Trieste while Ferruccio Parri in Rome sweats lest he lose the un-Italian Tyrol. Greeks who have themselves escaped alien rule by a miracle plan to establish their own alien rule over part of Albania.

In other words, most people are going right on acting and thinking precisely as they did before.

This is a dream. This is illusion. This is madness.

What's to Be Decided

Since July 16, 1945, the atomic bomb is the only important reality. For the atomic bomb is going to decide, not indeed the future of the human race—humanity is tough—not even the future of civilization, for the atomic bomb is itself civilization at its worst. No, the atomic bomb is going to decide "merely" the fate of all existing peoples and political systems, as well as the life or death of most living individuals.

Oh, yes, there is talk about the bomb in the papers. Nearly every day you can read what somebody, allegedly eminent, thinks we should do with the bomb—share it or keep it or "mark it with T." Yet you can read almost nothing about what the bomb is going to do with us unless we manage to make it harmless.

The President is "concerned." The Congress "views with alarm" and appoints committees. But, meanwhile, the agitation for keeping the "biggest navy in the world" goes right on. The clamor for bases continues. All beside the point. The American Government seems to consider the job of discovering the vital implications of the greatest discovery of all time as just another piece of ordinary business.

Who Knows What Results?

This too is madness. Tomorrow new nations will have the bomb. Day after tomorrow one of them will fall out with the rest of us. Next week (or next month or next year) it may decide to end the argument by using the bomb.

With what results—complete knock-out or just severe damage? Not even this is known. Yet just now this is the thing most worth knowing.

Back in the year one A. A. B. (ante atomic bomb), Air Marshal Billy Bishop of Canada was frantic over people's inability to see that the ordinary airplane was going to bust up the world unless it was tamed.

What Do We Await?

Since then the powers of destructiveness have been reinforced by the rocket bomb-carrier, the jet plane and the atomic bomb.

What else are we waiting for? The inventors of the bomb are becoming uneasy. The Tennessee group has issued a solemn warning. The parent Chicago group has sent an emissary to Washington to find out why so little is being done.

Maybe we the people ought to wake up. For since July 16, 1945, this planet has not been a cozy place to live on.

Connally Urges U. S. to Retain Atomic Secret

Tells V. F. W. He Doesn't Trust Some Nations to Use Bomb Only for Peace

By Luke P. Carroll

CHICAGO, Oct. 1.—Senator Tom Connally, Democrat, of Texas, chairman of the powerful Senate Foreign Relations Committee, said flatly today that the United States, by right of discovery, should retain the secret of atomic energy and use it as a weapon to maintain world peace.

"We found it first," he said. "It is ours. The world can rest assured that we shall never use it except in our necessary self-defense or in the interests of the peace of the world. Frankly, there are nations in the world that I wouldn't trust to restrict it to those purposes."

Senator Connally's remarks, made at the first session of the forty-sixth national encampment of the Veterans of Foreign Wars, were considered significant, since he frequently speaks for the Administration. President Truman said last week that he would give his views on sharing the atomic bomb secret in a message to Congress.

Senator Connally, who was a member of the United States delegation at the United Nations Conference at San Francisco, suggested that the discovery of the bomb probably would enable the United States alone to preserve world peace and also make this possible without keeping a huge military force in this country or elsewhere.

"The United States is a member of the Security Council (of the United Nations Organization), and as a member of the Security Council, when we are called upon to furnish an air contingent to preserve the peace of the world, that air contingent could carry along a bucket full of atomic bombs and stop any kind of outbreaks instantly," he said.

After he had delivered his address, he was asked what countries he would not trust with the secret and if any of those countries were members of the United Nations organization.

"You will have to be satisfied with what I said on the platform," he replied. "I'm not going into that any further."

Major Ivan C. Pavlov, secretary to the military attache at the Russian Embassy in Washington, who was seated on the platform, said he had no comment to make on Senator Connally's remarks.

In discussing the question of hoarding the secret of the atomic bomb, which was created through the combined efforts of American, British and Canadian scientists, Senator Connally wandered far from the language of his prepared text, although the theme remained the same.

The speedy discharge of men from the Army and Navy was another point emphasized by Senator Connally, who spoke before an audience of 500 veterans and some twenty representatives of the armed forces of other nations, here to attend a United Nations Veterans Victory Conference in conjunction with the V. F. W. convention.

The case for sharing the secret of atomic energy with the world was argued by Clark M. Eichelberger, of New York, director of the American Association for the United Nations and a consultant to the American delegation at the San Francisco Conference.

Declaring that there could be no enduring monopoly of the bomb, Mr. Eichelberger said that the General Assembly of the United Nations organization should be empowered to appoint a committee on atomic control to explore not only the controls to prevent atomic power from being used to destroy the world but also to establish universal benefits.

VFW Hears Bomb Debate

10/2 Special to THE NEW YORK TIMES.
CHICAGO, Oct. 1.—Opposing views as to controls of the atomic bomb were expressed today in speeches by Clark M. Eichelberger, director of the American Association for the United Nations, and Senator Tom Connally of Texas, chairman of the Senate Foreign Relations Committee, at the opening of the forty-sixth annual encampment of the Veterans of Foreign Wars.

Mr. Eichelberger said the atomic bomb problem should be turned over to the General Assembly of the United Nations Organization and a special committee should report on "what sovereignty should be sacrificed to prevent the new scientific discoveries from being used for aggressive purposes."

Colmer for New Policy

LONDON, Oct. 1 (AP)—Representative William M. Colmer of Mississippi, chairman of a special House committee on post-war economic policy, said in an interview today that the United States should retain the secret of the atomic bomb and use surplus military equipment in Europe to defray contributions to UNRRA.

Mr. Colmer said he was "fed up with pussyfooting" and contended that United States foreign policy must be placed on a "strict business basis."

"Loans to Russia—or any other country—should be dependent upon having America's interests safeguarded," Mr. Colmer said. "It is high time we started looking out for our own interests instead of playing Santa Claus throughout the world."

Holmes Asks Atom Bomb Ban

Abolition of the atomic bomb, because it "is an unpardonable violation of the moral law and our Christian faith, and in the end the sure extinction of mankind," was urged yesterday in a sermon by the Rev. John Haynes Holmes, minister of the Community Church, 123 West Forty-third Street. Praising General of the Army Douglas MacArthur for his "noble address" at the Japanese surrender ceremony, Mr. Holmes also called for "universal and immediate disarmament."

Bomb Defense Is Reported by Larry Crosby

Bing's Brother, Foundation Head, Will Tell Secret to Win Fair Play for U. S.

10/2
HOLLYWOOD, Oct. 1 (UP)—A simple, practical defense against the atomic bomb was claimed to have been found by the Crosby Research Foundation, which said it would hold to its secret unless assured it will be used to make other nations play fair with the United States.

Larry Crosby, president of the foundation, refused to reveal even the basic principle of the discovery, but said it was so simple that the bomb could be exploded from miles away, even without knowing their exact location.

"The bombs," he said, "can be blown up at will, along with their experimenters."

The six-year-old foundation was founded by Bing Crosby, his brothers, and half a dozen friends to help develop inventions useful in war.

So simple is the discovery, Mr. Crosby said, that there is danger of a catastrophe if some amateur experimenter should hit upon it and unintentionally explode a stronghouse of atomic bombs from miles away.

He would not reveal the name of the discoverer "for his own safety."

"This information should set worried minds at ease, but more important still, it should convince other nations that it would be futile to waste time, energy and billions to find the atom's secrets," Mr. Crosby said.

"We do not intend to divulge our information to any one unless we are utterly certain it will be used for one purpose only—to compel other nations to play fair with Uncle Sam."

The foundation headquarters is in a small, two-story building on the Sunset Strip, which serves as a sort of clearing house for inventions.

It helps inventors develop likely-looking ideas, and does research through scientists in universities and commercial laboratories. In return, it gets commissions from the inventors.

Bing, Bob and Larry Crosby, Johnny Burke, the song writer, and a few of their friends formed the foundation, so far engaged strictly in war work. Now, Larry Crosby said, they intend to develop some of their inventions commercially "to get some of our money back."

Obtaining atomic energy from uranium, the atomic bomb explosive, he indicated, will not be one of their projects.

HT "A Little Bomb" 10/2

The report attributing to Mr. Molotov the remark that Mr. Byrnes "doesn't need to persuade any one—he just has to hold up a little bomb" may be apocryphal. If it is true it might throw a flood of light over much in contemporary international politics and over the baffling complexities of the weapon on which the President is about to make his recommendations. Nobody conceives that another great war could come now, or in five years or ten years. In that sense the bomb is today utterly useless. But as an ultimate future threat to mankind it strongly suggests the complete impossibility of estimating what another war would be like or who would win it; and that, by a natural logic, suggests to all great powers the advisability of staking out as large and secure a position as possible now, while there is time. The future relations of states cannot be gauged, and none can feel secure in a present strength, however great, over which there hang such terrible and incalculable technical possibilities.

Any state might so reason, not even excluding the possessor of the atom bomb itself. Though by far the most dramatic and appalling of the new weapons, even the bomb is only one of them. The German V-rockets and high-speed submarines, the marvelous developments of radar, the reported new war gases of altogether novel powers, the new explosives, the possibilities of jet propulsion in airplanes—all these things, most of them just coming into practical development as the war ended, transform the face of war and present so many incalculables when considered all together that no man can possibly predict the limits of catastrophe which another war would mean. There are two lessons. One is to prevent another war. The other, often overlooked but detectable in the attitudes of more nations than one, is to put up as bold a front as possible today and get what can be got while the chance remains.

Godfather of Atom Bomb

Closeup
October 2, 1945

By HENRY BECKETT

Maj. Gen. Leslie R. Groves, the man in charge of the development of the almighty atomic bomb, has deep faith in the decency of his fellow Americans in times of peace as he has confidence and pride in their power and efficiency in times of war.

He insists he speaks for himself. But it is a fact that his attitude is that of the military command. He wants the United States to control the secret of the atomic bomb until all other nations open their lands to free travelers and a free press.

He would like to see all other nations show the same honest eagerness for peace that the United States does. When that time comes, he feels, the secret of the atomic bomb should be released to the world.

Evidently, then, he and our Army and Navy chiefs look on the atomic bomb as a weapon which can be as potent in keeping the peace as it was to bring peace, if directed with as much skill.

He Is Certain U. S. Won't Be an Aggressor

Not only the United States but the entire world will be safe, Gen. Groves believes, as long as the secret of the atomic bomb is kept here and no other nation succeeds in duplicating it. This is true, he thinks, for two reasons. First, the bomb is so potent that no nation without it will dare start a war. Second, Gen. Groves, Army career man and son of a chaplain, is sure this country won't be an aggressor.

The use of the bomb as a weapon for peace will be a fight against time just as was the case in war, but we have more time than some scientists have suggested, in the opinion of Gen. Groves. He feels that the scientists, in predicting the development of atomic bombs by other nations, in from two to five years, have assumed that American industrial efficiency can be matched elsewhere.

Gen. Groves emphasizes the role of industry more than that of scientific research. No such team work is possible in another country, he insists. He speaks of the energy of labor, of skill with precision machinery, of the co-operation of labor and management, as peculiar to American life.

From the Army point of view, the use of the atomic bomb as a

peace weapon means that peace will be secure as long as we have it exclusively and that during that period we can force agreement on effective measures against war.

Such hopes are the Army tradition as Gen. Groves absorbed it from his father, who died in 1939 but remains his spiritual guide. The Rev. Leslie R. Groves became an Army chaplain shortly before the Spanish-American War and soon after the birth of the son who has the Distinguished Service Medal for achievements "of unfathomable importance to the future of the nation and the World."

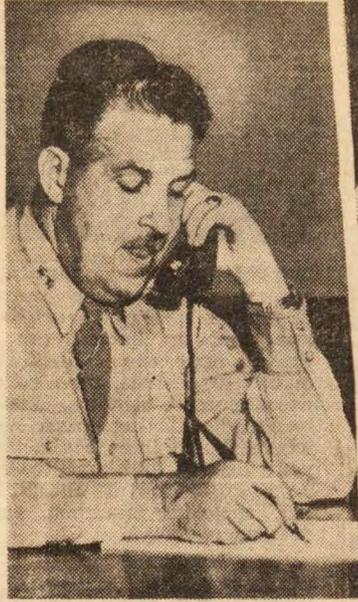
The general was born in the Presbyterian manse at Albany, and as a boy, living on Army posts, he was trained to think of the Army as an instrument for the preservation of peace. So, when he himself entered West Point, he looked forward to a life of Army service as right in line with religious activity. And now, strange as it may seem to the pacifist clergymen who deplored the atomic bomb, he takes satisfaction in that as an instrument for peace.

Misplaced Tenderness For Atomic Victims

Gen. Groves spoke as the father of Lt. Richard H. Groves, West Point graduate of last June. If the war had lasted a little longer, young Groves would have been in it. The lieutenant, so close to a share in history's greatest war, had had moments when he wished that his father had not been in such a hurry to drop those bombs.

Because of his conviction that physical force is not merely excusable but positively right when agents of evil are deaf to every persuasive sound except the explosion of a bomb, Gen. Groves has slight patience with those who lament the doings at Hiroshima and Nagasaki.

He replied, it seemed, with a hint of annoyance when asked whether a demonstration of the bomb, without any attack on a city, might not have been as effective in convincing the Japs that they'd better give up. He knows that "tender-hearted per-



Associated Press Photos

MAJ. GEN. GROVES

sons" had suggested that, but was not impressed. Such a demonstration, he reasoned, would not have had the powerful effect of surprise. The Japs might have appealed to the American people to refrain from using the bomb and then have gone on with the war. Or they might have discovered the secret or have learned how to meet the threat.

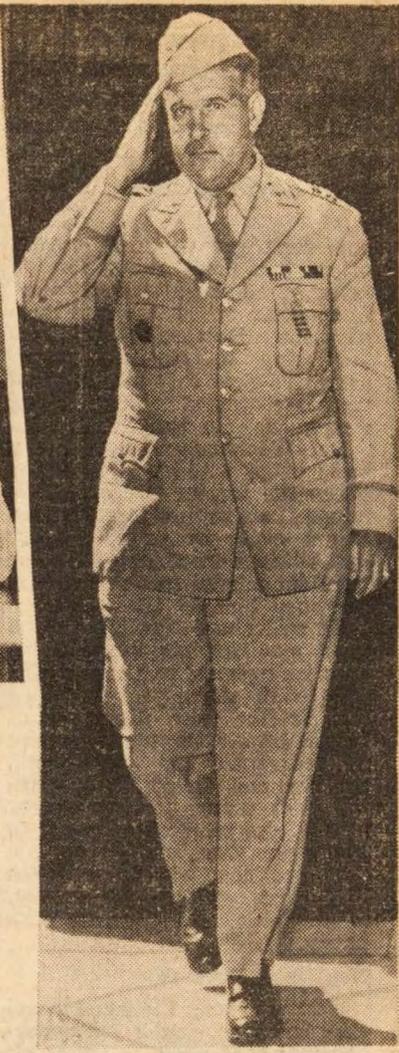
Jap Lives or Americans' Cleared the Issue

The general is sure that his father would have approved.

"My father passed some time in China," he said, "and knew how the Japs behaved. He told me, many times, what he thought. No one who saw what went on in China will waste time sympathizing with the Japs. Besides, it was a question of Jap lives or American lives. My stand is clear."

Mrs. Groves, the general's wife, is used to Army secrecy, she said, but this was such a marvellous secret that her feelings were a bit "miffed" when she learned of it through the newspapers. Even so, she knew it had to be that way.

Proudly, yet with an odd disquiet and sense of unreality, she heard this city's praise of the smiling, easy-going hulk of a man she has lived with for 23 years. She knows him as a still boyish, six-foot, 210-pound husband of 49 who dotes on a fast game of tennis, reads everything about the



Civil War, and is the father of a young lieutenant and a daughter, Gwen, 16, attending the National Catholic School for Girls, at Washington.

So this was the man she accompanied from one Army post to another. For the first 12 years of their married life he had been a lieutenant, for the next six, a captain, until the war started. While the greatest of wars raged, this soldier she married was only chief of some peculiar thing known as the Manhattan Engineering Project. There were times when she felt sorry for him. He had tried so hard to get overseas duty.

Then all of a sudden Mrs. Groves learned, through the newspapers, that this blandly reticent husband had hatched two bombs, each at a cost of \$1,000,000,000, and had organized a project engaging some of the world's most brilliant scientists and powerful

industrialists, with a total working force of 120,000 men and women. No wonder he had been hard to understand on returning from that unexplained trip to New Mexico.

As he remarked at the reception here:

"I couldn't attend to business for awhile afterwards. It was too big a letdown."

For her husband had been the boss at the ushering in of the Atomic Age.



ARMY AIR LEADERS WANT U. S. ON GUARD FOR SUDDEN ATTACK

NYT 10/2
With or Without Atom Power,
Continent-to-Continent Bomb-
ing Is Here, They Warn

CITE FLIGHT FROM JAPAN

Spaatz and Doolittle Say Alert
Air Force Is Vital—LeMay
and O'Donnell Honored

By JOHN STUART

Four of the top fighting generals of the Army Air Forces declared here last night that, atomic bomb or no atomic bomb, and despite the efforts of statesmen to assure a lasting peace, continent-to-continent bombing was here, and that the only adequate insurance for the United States was the development of the air weapons to defend her territory from sudden destruction.

At a dinner of the Wings Club in the Waldorf-Astoria Hotel, at which he presented the Distinguished Flying Cross to Lieut. Gen. Curtis E. LeMay and Brig. Gen. Emmett O'Donnell for their command of Superfortresses in the recent non-stop flight from Japan to Chicago, Gen. Carl Spaatz declared that the United States would find herself in a critical position unless adequate funds were available for the development of rockets, atomic power, planes with supersonic speeds and jet propulsion.

Doolittle Gives Facts

In this he was seconded by Lieut. Gen. James H. Doolittle, who pointed out that he first bombed Tokyo in 1942 with sixteen tons of bombs, but that in a single late raid by B-29s no less than 6,000 tons of bombs had been dropped.

The distinguished Flying Cross was presented also to all thirty members of the flight crews of the three planes.

Strong recommendations for parity of air command with land and sea commands in the political sphere were made by both Generals Spaatz and Doolittle. After their talks, Reed Chambers, president of the Wings Club, announced that the organization would support such a program. Other speakers at the dinner also declared it was necessary to give the Air Force full equality with the other commands.

Referring to the fact that General LeMay's plane had landed at Chicago, non-stop from Japan, with 7,200 pounds of extra gasoline, General Doolittle declared:

"This was a special mission, to be sure. But it indicated that with equipment similar to our own the Japanese could have bombed Chicago from Japan. As a matter of fact, the base in Hokkaido from which these planes took off was prepared for the specific purpose of sending bombers from Japan to America."

Discussing the fact that the Superfortresses whose commanders were honored last night had struck headwinds much of the way from Japan, he said this proved the ability of the B-29 to bomb Japan from United States territory. From the West Coast, he declared, our present planes could drop a 10,000-pound bomb load, atomic or otherwise, and that, starting from the Aleutians, they could drop 20,000 pounds of destruction on Japan.

General LeMay, pilot of one of the record-breaking Superfortresses, deplored that he had landed short of Washington, but said he had made the decision as a matter of safety.

"I hated like all hell to put that ship down at Chicago," he said. "I smoked a whole box of cigars. We made the trip on cigars, K rations and benzedrine. Nobody slept. But I couldn't take a chance on going on with a lot of the men on board ready for discharge from the Army."

"Now I'd like to try it Washington to Japan. It doesn't matter which way you go, I still know the B-29 can do it."

He declared that nobody hated war as much as the ordinary American and he praised the efforts of the statesmen to assure a lasting peace.

"But we've also got to be ready," he said. "We found out this time that being peace-loving and weak didn't stop us from getting into a fight. Maybe being strong and ready will do it. At any rate, our record on peace stands for itself, and I don't think any nation could justifiably conclude that by maintaining our strength we are doing anything but acting in self-defense."

He said he believed neither he nor anyone else knew the secret of defense against the atomic bomb.

"The most obvious fact is," he continued, "that if a hostile country develops a similar bomb and

desires to use it against us, it will come at us through the air. We just made a flight in three regular bombers that indicates that this might be done by the time the bomb can be duplicated in either of two ways: by a pilotless missile or by an aircraft making a round trip. If the atomic bomb is to come against us by air, we must build an aerial defense against it.

"I believe we could fly from the States to Europe in a B-29 right now, drop an atomic bomb and return safely. And, of course, if somebody in Europe had a B-29 or a better plane, they could do it to us."

Discussing various possible defenses against such an incursion, all of them aerial defenses, by the use of radar, radio fuses, guided missiles and jets, he said we had almost everything to learn about all of them.

Earlier in the evening it had been revealed that present plans called for the reduction of the Army Air Forces to 700,000 men from the present 2,500,000. All the officers expressed concern lest this deprive the Army of the men now trained in battle, without whom it would be difficult to make technical progress.

General Spaatz said it was impossible to estimate the number of airplanes a defense force would require until naval air requirements were known, hinting at the need for better coordination of the two services' plans, though not specifically advocating a single military department.

Lieut. Gen. Barney Giles, who on the record trip commanded the

third of the Superfortresses, which flew over the city at noon, was out of the country last night, but cabled to the dinner. The Superfortresses had picked up a fighter escort of Thunderbolts at Newcastle, Del., on their flight from Washington and flew in tight formation over Manhattan, the Bronx and Queens before landing at La Guardia Field at 1 o'clock. They were viewed by a crowd there yesterday and will be on view at the ATC hangar again today.

SAYS U. S. ALONE HAS ATOM-BOMB MEANS

NYT 10/2
No nation other than the United States can produce an atomic bomb because none other has sufficient wealth, materials and industrial resources, Dr. Walter R. G. Baker, vice president of the General Electric Company, said yesterday, the United Press reported.

Dr. Baker is in charge of the \$10,000,000 Electronics Park being built north of Syracuse, N. Y., where G. E. will manufacture television equipment, radar, wire recorders and other electronic devices.

"Asking why some other country may not discover how to make atomic bombs is like asking why China doesn't have a television system," Dr. Baker said. "China has scientists who understand the basic theory of television as well as we do. But they haven't got the workmen or the equipment to build and operate the stations."

"So with the atomic bomb. It is not so much a question of other nations discovering its secret; that is, the physics involved. They probably know that now. It's a question of whether there is another country rich enough and industrially strong enough actually to make one."

Dr. Baker said that it should be remembered that we had carried on the work of creating the bomb in an "economic vacuum" where money was no consideration.

German May Get Nobel Prize

STOCKHOLM, Oct. 2 (AP).—The newspaper "Aftonbladet" said today that Otto Hahn, German authority on radio-activity and the atom, probably would receive one of this year's Nobel Prizes. Without giving the source of its information, the newspaper said Hahn was now in England. It suggested that he might have been

taken there after being found in Germany by Allied occupation authorities.

'BIG CITIES DOOMED BY ATOM,' HE WILLS LIBRARY TO TAHITI

NYT 10/3
Hollywood, Oct. 3 (AP)—Maurice De Kobra, French novelist who has been in Hollywood three years, has prepared a will leaving his library of 17,000 books and works of art to the town of Papeete, Tahiti, because he says he believes humanity is doomed by atomic energy.

"I am convinced that the release of atomic energy means the doom of humanity and, within a little time, the total destruction of big cities like Paris, Washington, London and New York," DeKobra said.

He believes remote spots will escape atomic destruction.

Ceremony at Columbia

The War Department will pay its official respects Thursday to Columbia University for the contributions made by the institution to the research which brought forth the atomic bomb.

In the presence of several hundred scientists, faculty members, and representatives of the Army and Navy, Major General Leslie R. Groves, commanding officer of the atomic bomb project, will present to the university, on behalf of the War Department, a scroll setting forth Columbia's part in the development of the world's most powerful weapon. The exercises will be held at 3 p. m. in the rotunda of the Low Memorial Library on the campus.

GERMANS WILL AID U. S. WAR RESEARCH

Scientists Have Volunteered to
Come to This Country to Work
on Projects, Army Says

Special to THE NEW YORK TIMES

WASHINGTON, Oct. 1—The brains which produced some of Germany's secret weapons are being brought to the United States on a voluntary basis to aid in military research, the War Department revealed today.

Secretary Patterson has approved a project whereby "certain outstanding German scientists and technicians" are being brought to this country "to insure that we take full advantage of those significant developments which are deemed vital to our national security," the department said.

Mr. Patterson released last week a report from Maj. Alexander P. de Seversky, who toured Europe as a special consultant, urging that German scientists be brought to the United States as a "prize of war" to finish some of their experiments for America's benefit.

Major de Seversky, an aviation expert, said that the Germans were ahead of this country in a number of fields, including jet propulsion and faster-than-sound speeds.

The War Department, however, apparently has been planning along such lines for some time. Late in August, Army headquarters in Europe said that some German air scientists would be shipped to this country to work under Army supervision. Their stay would be temporary and they would not be allowed to bring their families with them.

"Interrogation and examination of documents, equipment and facilities in the aggregate are but one

means of exploiting German progress in science and technology," the War Department said today, adding:

"In order that this country may benefit fully from this resource, a number of carefully selected scientists and technologists are being brought to the United States on a voluntary basis.

"These individuals have been chosen from those fields where German progress is of significant

importance to us, and in which these specialists have played a dominant role.

"Throughout their temporary stay in the United States, these German scientists and technical experts will be under the supervision of the War Department, but will be utilized for appropriate military projects of the Army and Navy."

The scientists were not identified.

GASES EXPLAIN SIZE OF ATOMIC PLANTS

The Necessity of Diffusing Uranium Hexafluoride Is Basis of Huge Factories

PROCESS IS DESCRIBED

NYT 10/3
Graham's Law Fixing Ratio of Passage of Gases Through Porous Material Used

Following is the sixth of a number of articles by a staff member of THE NEW YORK TIMES who was detached for service with the War Department at its request to explain the atomic bomb to the lay public. He witnessed the first test of the bomb in New Mexico and, on a flight to Nagasaki, its actual use.

By WILLIAM L. LAURENCE

In "Atomland-on-Mars," where the impossibles of yesterday have become actualities taxing credulity, the privileged visitor is shown a strange building, resembling a fair-sized football stadium and covering an area of several million square feet.

It is one of the gigantic plants where the foundations are being laid for the civilization of tomorrow. It is here where uranium 235 (U-235), the element yielding great amounts of atomic energy, is being concentrated by a method entirely different from the electromagnetic method, previously described in these articles.

At the time when the Atomic Bomb Project, known as the Manhattan Engineer District, was organized under the auspices of the Army Corps of Engineers, a number of possible methods for concentrating U-235 were under consideration by our scientists.

Each method presented tremendous obstacles. Since we were entering the darkest jungles of the "Dark Africa of Matter," where many an unknown danger awaited us, it was decided to explore the new continent of the atom by several different routes, so that if one failed the other might succeed.

Different Methods Used

Accordingly, several different types of plants, each employing a different method for producing U-235, as well as other plants for producing Element 94, or plutonium, the man-made element not found in nature, were constructed at secret sites in widely separated sections of the country. In every one of them tremendous obstacles, many of them unforeseen, were successfully overcome.

Yesterday these mammoth plants produced the raw materials for the atomic bomb. Tomorrow these same materials may be used for ushering in the new Age of Atomics, or Nucleonics, an age in which man will have at his disposal the practically inexhaustible energy that nature has locked up in the nuclei of the atoms of which the material universe is constituted.

Like the electromagnetic plant for separating U-235, the stadium-shaped plant is also part of the mammoth Clinton Engineer Works, situated on the 59,000-acre Government reservation in the Tennessee Valley, eighteen miles northwest of Knoxville. In this plant, however, the method of concentration of the U-235 is based on the principle governing the diffusion of gases known as Graham's Law, as elaborated on by Lord Rayleigh as far back as 1896.

According to Graham's Law, the rates of diffusion of different gases through a porous material are, under similar conditions, inversely proportional to the square roots of the molecular weights of the gases. For example, if one gas, A, has a molecular weight of 9, and another gas, B, has a molecular weight of 16, the rate of diffusion of gas A through a porous medium, as compared with the rate of diffusion of gas B, will be in the ratio of 4 volumes of gas A (the lighter gas) to 3 volumes of gas B.

Changing the Ratio

When a mixture of gas A and gas B is allowed to diffuse through a suitable porous medium, under ideal conditions, the ratio of gas A to gas B, in the portion first passing through the medium, will thus be 1.33 times greater than the original ratio of A to B. By subjecting the portion first diffused to the same process a gas mixture in which the ratio of A to B is increased by a second factor of 1.33 can be obtained. In fact, the process can be repeated at will, finally achieving any desired ratio of A to B.

In a practical plant, however, the separation factor in this particular example will not reach the ideal value of 1.33, but may go as high as 1.2.

As an example of such a plant, let us assume that the ratio of gas A to gas B is 1 to 50 and we want to change it to 1,000 to 1. Assuming that we obtain an increase in ratio of 1.2 of A to B at each stage, we would require a plant in which the diffusion process is repeated sixty times.

When our scientists and engineers first considered the possibility of separating U-235 from the U-238 by the gaseous diffusion method in accordance with the Graham-Rayleigh principle they were confronted with a host of obstacles that at first seemed insurmountable.

Applying our example to the case of uranium will illustrate the magnitude of the separation problem. Since uranium itself is not a gas, some gaseous compound of uranium had to be used. The only uranium compound at that time known that could be converted into a suitable stable gas was uranium hexafluoride, a combination of one atom of uranium and six atoms of fluorine, that would corrode practically anything with which it comes in contact.

Not only is this gas highly reactive but it is actually a solid at room temperature and atmospheric pressure.

For these reasons a study of other gaseous compounds of ura-

nium was urgently undertaken. As insurance against failure in this search for alternative gases, it was necessary to continue work on uranium hexafluoride, as in devising methods for producing and circulating the gas.

It was realized from the beginning that a plant for concentration of U-235 by the gaseous diffusion method had to be of enormous dimensions, regardless of whether uranium hexafluoride or some other type of uranium gas was used. This can be illustrated by taking uranium hexafluoride as an example, though it would apply to other uranium gases as well. The molecular weight of the uranium 238 hexafluoride is 352, whereas the uranium-fluorine gas containing six atoms of fluorine and one atom of uranium 235 has a molecular weight of 349.

Since, according to the Graham Law, the rate of diffusion of the gas containing U-235, as compared with the gas containing uranium 238, would be inversely proportional to the square roots of their molecular weights—that is, in the ratio of the square root of 352 (18.76) to the square root of 349 (18.68)—the increase of the concentration of the U-235 hexafluoride would be by a factor of only 1.0043. Under actual operating conditions this value is even smaller.

Thousands of Stages

This is, indeed, a very small enrichment factor. Hence, to bring it up to the desired level, it became necessary to design and construct a gigantic cascade in which the gas to be separated is made to pass through thousands of successive stages, each stage enriching the proportion of the U-235 gas over the preceding stage, the enriched mixture passing on to the next stage where it is further enriched. No such plant for separation of gases had ever been designed or even conceived.

One of the principal problems that had to be solved before the plant could be built involved the development of a suitable porous medium, or barrier, through which the uranium gas mixture had to be diffused in a manner to allow a greater proportion of U-235 to pass through, as compared with U-238.

It has been established that the pores of the barrier through which a gas mixture is diffused must be considerably smaller than the average distance a gas molecule travels before it collides with another gas molecule, a distance known as the "mean free path." At atmospheric pressure the mean free path of a molecule is of the order of a ten-thousandth of a millimeter or a tenth of a micron. To insure true diffusive flow of the gas the diameter of the myriad holes in the barrier must be less than one-tenth of the mean free path—that is, about one-hundredth of a micron, or about four ten-millionths of an inch.

Such a barrier must have billions of holes of this size or smaller. Furthermore, these holes must not enlarge or plug up as the result of direct corrosion or dust coming from corrosion elsewhere in the system. The barrier must be able to withstand the pressure "head" of one atmosphere. It also had to be of a type that could be manufactured in large quantities and with uniform quality.

It was further realized that thousands of powerful pumps would be needed and thousands of kilowatts to operate them. Too, that the whole circulating system would have to be made vacuum tight and leak proof, requirements presenting problems of a magnitude never faced before. This vast plant is now operating successfully after surmounting every obstacle.

A new industry had to be developed to manufacture the porous barrier, for the gaseous diffusion.

Big Powerhouse Built

To satisfy the demands for power, a huge powerhouse was constructed, the largest initial single installation of its kind ever built.

The scientific research work on the diffusion process was initiated by Prof. John R. Dunning of Columbia University, and was carried on in a large building in upper Manhattan, under a contract between Columbia and the Office of Scientific Research and Development (OSRD), until May 1, 1943, when the work was taken over by the Manhattan Engineer District.

In 1942 the M. W. Kellogg Company was chosen to plan the large-scale plant. For these purposes that company created a special subsidiary, the Kellex Corporation, and placed Dr. P. C. Keith in charge of it. The Kellex Corporation not only planned and procured materials for the large-scale plant, but also carried on research and development in its Jersey City laboratories and with the Columbia group. The plant was constructed by the J. A. Jones Construction Company, Inc., of Charlotte, N. C.

In January, 1943, Carbide and

Carbon Chemicals Corporation was selected as the operator of the plant. Its engineers soon began to play a large role not only in the planning and construction but also in the research work.

Construction of the main process plant began Sept. 10, 1943, and the plant was in successful operation before the summer of 1945.

SCIENTISTS 'CREATE' IN ATOMIC PROJECT

Forming of Element Unknown
in Nature From Uranium
Epic in Man's History

NEUTRON THE KEY FACTOR

Its Effect in Atom Nucleus Put
to Use in Production of
the New Plutonium

Following is the seventh of a number of articles by a staff member of THE NEW YORK TIMES who was detached for service with the War Department at its request to explain the atomic bomb to the lay public. He witnessed the first test of the bomb in New Mexico and, on a flight to Nagasaki, its actual use.

By WILLIAM L. LAURENCE

When the full details of the development of the atomic bomb can finally be told the story of the creation, production and purification of Element 94, named plutonium, will stand out as one of the great epics of history and as a distinct turning-point in the life of man on earth.

In this achievement our scientists not only have realized the dream of the ages, the transmutation of one element into another; they have accomplished what even the ancient alchemists did not dare dream about. For not only have they succeeded in transmuting one element into another, in relatively enormous quantities, they have created an entirely new element that never before was known to exist in nature, an element that, like U-235, releases enormous amounts of atomic energy.

It is as if nature had become tired after creating uranium, her ninety-second element, and decided to "call it day." Now comes man and takes up the work where nature left off billions of years ago.

To understand how this was done requires the statement of some elementary facts about the constitution of the nuclei of atoms, in which more than 99.999 per cent of the mass and energy of the material universe is concentrated.

The nuclei are composed of two types of fundamental particles, protons and neutrons. Both have about the same mass, or atomic mass 1. But whereas the proton carries a constant fundamental unit of positive electricity, the neutron, as its name implies, is electrically neutral.

Chadwick's Discovery Basis

The discovery of the neutron in 1932 by Sir James Chadwick, then at the Cavendish Laboratory, Cambridge University, England, for which he won the Nobel Prize and knighthood, ranks with the greatest scientific discoveries of all time. It was this discovery that finally gave man the key to the atom. It opened the way for the transmutation of the elements and for the release of atomic energy. It made possible the atomic bomb and holds the promise for greater things to come. It is the Philosopher's Stone the alchemists looked for in vain.

While much still remains to be learned about the neutron, enough about it has been learned during the past ten years to make it the most useful tool in the study of the atom. It behaves differently under different conditions. Under certain conditions it acts in the manner of a particle that carries both a positive and a negative fundamental unit of electrical charge of equal magnitude. The two electrical charges thus balance one another, making the particle electrically neutral.

By the use of the cyclotron, gigantic atomic "merry-go-round" apparatus, neutrons can be fired at tremendous energies at the nuclei of atoms. Some of these neutrons penetrate the nucleus and remain there. When that happens the atomic weight of the atom is increased by one atomic mass unit. In that event the particular element does not change in identity. It becomes what is known as an "isotope" of the element, slightly heavier in weight, but still possessing the same chemical characteristics.

In many cases, however, the entry of a new neutron produces a cosmic cataclysm inside the nucleus, setting to work mighty forces greater, in proportion, than the eruption of the greatest terrestrial volcano or the most devastating earthquake.

When this atomic eruption takes place it often manifests itself in the emission of a negative charge of electricity, generally referred to as a beta particle, or negative electron. This negative electron comes from one of the neutrons in the nucleus.

Neutron Now Becomes Proton

Since that particular neutron originally had both a negative and a positive charge of electricity, the loss of the negative charge changes its character entirely. It is no longer an electrically neutral particle, for it now has a positive charge of electricity. In other words, the neutron has become a proton.

The atom to which this happens thus gets not only an extra unit of atomic weight but also an extra unit of positive electricity in its nucleus. This brings about a fundamental change in the nature of the atom, creating an entirely different element, since the nature and properties of the various elements depend entirely on the number of positively charged particles—i. e., protons, in their nucleus.

The material universe as we know it is made up of ninety-two elements, beginning with hydrogen, the lightest of the elements, at one end of the atomic table, and ending with uranium, the heaviest of the natural elements, at the other end. The elements are numbered from 1 to 92, each number corresponding to the number of positive electrical particles in the nuclei of their atoms. Thus, hydrogen, with atomic No. 1, has one positive particle, or proton, in

its nucleus; helium, atomic No. 2, has two protons; lithium, the third element, has 3; and so on, up to uranium, the ninety-second and last natural element, which has ninety-two protons in the nucleus of its atom.

In addition to the protons, the nuclei of the atoms of most of the elements also contain neutrons. The effect of this is to make their atomic weight greater than the atomic number, this increase in weight depending on the number of neutrons, each neutron, as well as each proton, having an atomic mass value of 1.

For example, carbon occupies atomic No. 6 on the Periodic Table of Elements. This means it contains 6 protons in its nucleus. But it has an atomic weight of 12. This means that in addition to the 6 protons its nucleus also has 6 neutrons.

Similarly with uranium. It occupies atomic No. 92 on the Periodic Table. This means its nucleus contains 92 protons. One form (isotope) of uranium has an atomic weight of 238. Subtracting 92 from 238 gives the number of neutrons in the uranium nucleus as 146.

Another form of uranium known as uranium 235, the spectacular atomic energy element, still occupies No. 92 on the Periodic Table. But its atomic weight is 235. This means that it has the same number of protons in its nucleus as uranium 238 (U-238) but 3 fewer neutrons.

Two Transmutations of U-238

With these facts in mind we are now ready to understand the basic principles of the creation of plutonium, Element 94.

We start with uranium 238. A neutron is fired into its nucleus. This sets in motion a series of cosmic events of tremendous consequences.

The neutron first lodges in the nucleus of the uranium 238 atom. This increases the atomic weight of the atom by 1 mass unit. The element is still uranium, but instead of an atomic weight of 238 it now has a mass of 239. It has 147 neutrons instead of 146.

But this form of uranium 239 has a rather-turbulent and hectic existence. Atomic eruptions take place of super-volcanic dimensions. Soon a negative electric charge—namely, a beta particle—comes flying out.

This negative particle is lost by one of the 147 neutrons in the uranium 239 nucleus. As explained earlier, that neutron is now left with a positive charge. It is now a proton. In other words, the uranium 239 now has only 146 neutrons in its nucleus. But instead of its original 92 protons it now has 93.

This means that a new element has been created out of the uranium, Element 93 out of Element 92. Since uranium was named after the planet Uranus, the element beyond uranium was named neptunium, after Neptune, the planet beyond Uranus.

But the volcanic eruptions started by the original neutron does not end here. Neptunium, an element that was not known to exist in

nature, also has a turbulent short life.

In a short time a negative electron (beta particle) comes shooting out of its nucleus. The same process repeats itself. One of the 146 neutrons in the neptunium nucleus, having lost its negative electrons, becomes transmuted into a proton.

This means that the nucleus of the element now has ninety-four protons and only 145 neutrons. It still has the same atomic weight of 239 but it is now once again an entirely new element, totally different from both uranium 238, its grandparent, and its immediate ancestor, neptunium.

How this transmutation was achieved on a mass-production basis will be told in a subsequent article.

Gets 'E' for Atomic Bomb Work

Special to THE NEW YORK TIMES.

NIAGARA FALLS, Oct. 3—The Hooker Electro Chemical Company and its employes have received a special Army-Navy "E" award for their work in helping the development of the atomic bomb. Previously they had been honored by five successive Army-Navy "E" production awards.

Atom Scientists May Lobby for Sharing Bomb

Say Secret Can't Be Kept,
Want Public to Know;
Army Keeps Them Silent

By Stephen White

CHICAGO, Oct. 2.—Seriously concerned over the failure of the American people and their government to understand what they believe to be the facts of the atomic bomb and its social and political implications, the scientists who developed the bomb have organized into pressure groups and are planning a sizable program of public education.

Their general attitude is one of rebellion against the War Department, which has, they contend, used every means at its command to prevent free expression of opinion by the scientists who worked on atomic energy. As yet they have not dared to make any direct break with the Army, but it is clear that such a break is only days away.

The University of Chicago, which, since the early days of the Manhattan District project has been one of the primary scientific centers for the atomic investigation, is now the rallying point for physicists, chemists and mathematicians, who fear desperately that this country may take the road to ruin unless enlightenment which they can provide is made available to the public.

Officially, the university has no part in the movement. It stems from three voluntary associations of scientists, one comprising the major proportion of the investigators at Oak Ridge, Tenn.; another similar group at Los Alamos, N. M.; and a third group, which is stationed here at the university.

Their Views Are Ready

Each group, it was learned today, has organized, prepared statements of intent and, in its own fashion, set about the business of

getting its point of view before the public.

Members of all three groups are meeting here from time to time in attempts to co-ordinate their efforts. As yet, they have been unable to decide the best method for broadcasting their views, but there is little disagreement as to the nature of the things they want to say.

Primarily, they believe that there is no atomic secret and that any attempt to pretend that such a secret exists menaces the safety of this country. With almost no exception, every scientist who has worked on the atomic bomb emphasizes that no major country can be prevented from duplicating America's success.

Most of them believe that, if this country attempts to withhold its information, other countries will have drawn even with the United States within five years. There are some who believe that, spurred by American failure to share the information, other countries will be led to experimentation that may enable them to surpass the United States.

All of them fear the anarchic international situation that will result from an unbridled atomic armament race, with the tensions that will inevitably be set up among the nations.

Have Thought of It So Much

In some aspects they ask for credence on the basis of their scientific knowledge. But more than that, they call attention to the fact that these matters have been on their minds for three years, ever since it became clear that the atomic bomb was on its way. During that period they were the only people in the world who could think sensibly on the social aspects of the world-in-the-making, and they did little else in their spare moments. In quantity of thought, they can assert, they certainly stand alone, and they are not disposed to deprecate the quality of their thought.

The men who say these things are men whose names command immediate respect: educators, experts, Nobel Prize winners. But they will not let their names be used. The top men have been warned by the Army that they may not speak out without clear-

ance by the War Department. This warning has been on non-technical matters connected with the bomb. The Army writes that the restriction includes "any proposed advertising or news release."

Another large group, foreign-born, is deterred also by the fear that any statements they may make will be labeled "foreign," and the entire movement harmed. The resentment these men feel against the Army is great. It extends throughout their ranks. Believing as they do that there is truly no atomic secret, they are none the less willing to restrict technical information, if the government desires them to do so.

Truman's Message to Congress on Atom Bomb

WASHINGTON, Oct. 3 (AP)—The text of President Truman's message to Congress today on the atomic bomb follows:

Almost two months have passed since the atomic bomb was used against Japan. That bomb did not win the war, but it certainly shortened the war. We know that it saved the lives of untold thousands of American and Allied soldiers who would otherwise have been killed in battle.

The discovery of the means of releasing atomic energy began a new era in the history of civilization. The scientific and industrial knowledge on which this discovery rests does not relate merely to another weapon. It may some day prove to be more revolutionary in the development of human society than the invention of the wheel, the use of metals, or the steam or internal-combustion engine.

Never in history has society been confronted with a power so full of potential danger and at the same time so full of promise for the future of man and for the peace of the world. I think I express the faith of the American people when I say that we can use the knowledge we have won not for the devastation of war but for the future welfare of humanity.

To accomplish the objective we must proceed along two fronts—the domestic and the international.

Calls U. S. Policy First Need

The first and most urgent step is the determination of our domestic policy for the control, use and development of atomic energy within the United States.

We cannot postpone decisions in this field. The enormous investment which we made to produce the bomb has given us the two vast industrial plants in Washington and Tennessee, the many associated works throughout the country. It has brought together a vast organization of scientists, executives, industrial engineers and skilled workers—a national asset of inestimable value.

The powers which the Congress wisely gave to the Government to wage war were adequate to permit the creation and development of this enterprise as a war project. Now that our enemies have surrendered, we should take immediate action to provide for the future use of this huge investment in brains and plant.

I am informed that many of the people on whom depend the continued successful operation of the plants and the further development of atomic knowledge are

getting ready to return to their normal pursuits. In many cases these people are considering leaving the project largely because of uncertainty concerning future national policy in this field. Prompt action to establish national policy will go a long way toward keeping a strong organization intact.

It is equally necessary to direct future research and to establish control of the basic raw materials essential to the development of this power whether it is to be used for purposes of peace or war. Atomic force in ignorant or evil hands could inflict untold disaster upon the nation and the world. Society cannot hope even to protect itself—much less to realize the benefits of the discovery—unless prompt action is taken to guard against the hazards of misuse.

Puts Policy Up to Congress

I therefore urge, as a first measure in a program of utilizing our knowledge for the benefit of society, that the Congress enact legislation to fix a policy with respect to our existing plants, and to control all sources of atomic energy and all activities connected with its development and use in the United States.

The legislation should give jurisdiction for these purposes to an atomic energy commission with members appointed by the President with the advice and consent of the Senate.

The Congress should lay down the basic principles for all the activities of the commission, the objectives of which should be the promotion of the national welfare, securing the national defense, safeguarding world peace and the acquisition of further knowledge concerning atomic energy.

The people of the United States know that the overwhelming power we have developed in this war is due in large measure to American science and American industry, consisting of management and labor. We believe that our science and industry owe their strength to the spirit of free inquiry and the spirit of free enterprise that characterize our country.

The commission, therefore, in carrying out its functions should interfere as little as possible with private research and private enterprise, and should use as much as possible existing institutions and agencies. The observance of this policy is our best guarantee of maintaining the pre-eminence in science and industry upon which our national well-being depends.

All land and mineral deposits

owned by the United States which constitute sources of atomic energy, and all stock piles of materials from which such energy may be derived, and all plants or other property of the United States connected with its development and use should be transferred to the supervision and control of the commission.

The commission should be authorized to acquire at a fair price, by purchase or by condemnation, any minerals or other materials from which the sources of atomic energy can be derived, and also any land containing such minerals or materials, which are not already owned by the United States.

The power to purchase should include real and personal property outside the limits of the United States.

The commission should also be authorized to conduct all necessary research, experimentation, and operations for the further development and use of atomic energy for military, industrial, scientific or medical purposes. In these activities it should, of course, use existing private and public institutions and agencies to the fullest practicable extent.

Under appropriate safeguards, the commission should also be permitted to license any property available to the commission for research, development and exploitation in the field of atomic energy. Among other things, such licensing should be conditioned, of course, upon a policy of widespread distribution of peacetime products on equitable terms which will prevent monopoly.

Urges Control of Materials

In order to establish effective control and security, it should be declared unlawful to produce or use the substances comprising the sources of atomic energy or to import or export them except under conditions prescribed by the commission.

Finally, the commission should be authorized to establish security regulations governing the handling of all information, material and equipment under its jurisdiction. Suitable penalties should be prescribed for violating the security regulations of the commission or any of the other terms of the act.

The measures which I have suggested may seem drastic and far reaching. But the discovery with which we are dealing involves forces of nature too dangerous to fit into any of our usual concepts.

The other phase of the problem is the question of the inter-

national control and development of this newly discovered energy.

In international relations, as in domestic affairs, the release of atomic energy constitutes a new force too revolutionary to consider in the framework of old ideas. We can no longer rely on the slow progress of time to develop a program of control among nations. Civilization demands that we shall reach at the earliest possible date a satisfactory arrangement for the control of this discovery, in order that it may become a powerful and forceful influence toward the maintenance of world peace instead of an instrument of destruction.

Scientific opinion appears to be practically unanimous that the essential theoretical knowledge upon which the discovery is based is already widely known. There is also substantial agreement that foreign research can come abreast of our present theoretical knowledge in time.

Would Guard Production Secrets

The hope of civilization lies in international arrangements looking, if possible, to the renunciation of the use and development of the atomic bomb, and directing and encouraging the use of atomic energy and all future scientific information toward peaceful and humanitarian ends. The difficulties in working out such arrangements are great.

The alternative to overcoming these difficulties, however, may be a desperate armament race which might well end in disaster. Discussion of the international problem cannot be safely delayed until the United Nations Organization is functioning and in a position adequately to deal with it.

I therefore propose that these discussions will not be concerned with disclosures relating to the manufacturing processes leading to the production of the atomic bomb itself. They will constitute an effort to work out arrangements covering the terms under which international collaboration and exchange of scientific information might safely proceed.

The outcome of the discussions will be reported to the Congress as soon as possible, and any resulting agreements requiring Congressional action will be submitted to the Congress.

But regardless of the course of discussions in the international field, I believe it is essential that legislation along the lines I have indicated be adopted as promptly as possible to insure the necessary research in, and development and control of, the production and use of atomic energy.

TRUMAN SUGGESTS ATOMIC BOMB BAN, U. S. CONTROL BODY

Warns Congress That Force
'in Evil Hands Could Inflict'
Disaster Upon World

NYT 10/4
SECRETS WILL BE GUARDED

President Plans to Initiate
Talks With Other Nations
on Peaceful Use of Power

Text of President's message
on atomic power is on Page 4.

By FELIX BELAIR JR.

Special to THE NEW YORK TIMES.

WASHINGTON, Oct. 3—President Truman warned Congress and the country in a special message today that "atomic force in ignorant or evil hands could inflict untold disaster upon the nation and the world" and urged the prompt creation of an atomic energy commission to regulate all research, experimentation and operations in the new discovery for any purpose.

Bills were introduced promptly in both the House and Senate to carry out the proposals of the President, but the introduction of the legislation in the Senate caused a squabble over committee jurisdiction.

The President said that the future hope of civilization lay in international arrangements looking to the renunciation of the use and development of the atomic bomb and concentration instead on the development of atomic energy for peaceful uses. He proposed to send at a later date a separate message to Congress discussing the international aspects of the problem.

To Initiate World Talks

Meanwhile, however, President Truman said that these international phases could not be safely delayed until the United Nations organization was functioning. He added that for this reason he would initiate discussions with Great Britain and Canada, and then with other nations to reach an agreement on the conditions under which cooperation might replace rivalry in the field of atomic power. He said that American production methods would be kept secret during these conversations.

The squabble in the Senate arose when Senator Edwin C. Johnson, Democrat, of Colorado, announced that he was introducing a bill "to carry out the recommendations of the President" and asked that it be referred to the Military Affairs Committee and Senator Arthur H. Vandenberg, Republican, of Michigan, objected strenuously.

"This isn't a military question," Senator Vandenberg said. "It is a question touching every phase of civilian life. It fundamentally touches international relations. The Foreign Relations Committee has jurisdiction just as much as the Military Affairs Committee."

Senator Vandenberg went on to say that the dispute occasioned by the reading of the President's message itself proved that none of the standing committees of Congress provided "an appropriate forum" for consideration of the problem of atomic power. He said that it required a special joint committee of the Senate and House, such as provided in a resolution he recently introduced.

"To deal with this matter in scatter-splash fashion would be a most unfortunate approach to the supreme problem facing civilization today," Senator Vandenberg said.

Senate Defers Action

Senator Wallace H. White Jr., Republican, of Maine the minority leader, took the floor to say that the President's message in itself "fortified" Senator Vandenberg's contention. But Senator Alben W. Barkley, Democrat, of Kentucky, majority leader, was quick to observe that the joint committee proposed by Senator Vandenberg would have no "legislative jurisdiction" and anything that it recommended would have to go through the Senate standing committees anyway.

In the end it was agreed all around that the question of committee jurisdiction should be put over until tomorrow and that the Johnson resolution should be tabled.

On the other side of the Capitol, Representative Andrew J. May, Democrat, of Kentucky, chairman of the House Military Affairs Committee, introduced the legislation conforming to the President's message.

Mr. May said that his measure was being introduced at the request of Secretary of War Robert P. Patterson, who authorized the explanation that it had been drafted by a committee approved by President Truman and after several months' work and consultation with leading scientists.

President Truman, in urging Congress to create an atomic energy commission, said that

"never in history has society been confronted with a power so full of potential danger and at the same time so full of promise for the future of man and for the peace of the world."

"I think I express the faith of the American people when I say that we can use the knowledge we have won, not for the devastation of war, but for the future welfare of humanity," the President said.

Congress to Fix Policy

Members of the proposed commission would be appointed by the President with the advice and consent of the Senate, under the recommendations of the message.

The President recommended that the commission be empowered to do the following things:

- (1) Supervise and control all land and mineral deposits owned by the United States constituting sources of atomic energy and all stockpiles of materials from which such energy may be derived and all plants or other property of the United States in connection with its development and use.
- (2) Acquisition at a fair price of any minerals or the materials from which the source of atomic energy could be derived, and any land containing such minerals or materials not already owned by the United States.
- (3) Conduct all research, experimentation, and operations for the further development and use of atomic energy for military, industrial, scientific, or medical purposes. Existing public and private institutions and agencies to be used to the fullest extent practicable.
- (4) License any property available to the commission for research development and exploitation in the field of atomic energy, such licensing to be conditioned on a policy of widespread distribution of peacetime products on equitable terms to prevent monopoly.
- (5) Establish security regulations governing the handling of all information, material and equipment under its jurisdiction. Suitable penalties to be prescribed for violating the security regulations of the commission or of any of the other terms of the act.

Peron Bans Uranium Export

BUENOS AIRES, Oct. 3 (AP)—Argentine banned today the export of uranium—vital mineral in the development of the atomic bomb.

Vice President and Minister of War Col Juan D. Peron, in announcing the decree, said that the action had been taken because of "the utmost importance for the future of the multiple application of the mineral."

MR. TRUMAN ON ATOMIC ENERGY

President Truman could have announced an atomic energy policy of his own. He could, under his war powers, have named an "Atomic Energy Commission" to study the problem. Yesterday he chose, and wisely, to share this responsibility with Congress. It is a twofold responsibility. How shall we control the development of this new power, with its vast possibilities for good as well as evil, within our own borders? To what extent and in what way shall we cooperate with other nations to make certain that it is not used destructively?

If the steam engine, the electric generator or the internal combustion engine were newly invented this year we could safely leave them to private enterprise. Later we would be able to regulate them in the public interest or, in the case of electricity produced by water-driven generators, experiment with public ownership. Atomic energy is a giant which cannot be handled in this fashion. Its constructive use must be begun under governmental control. The whole future of civilization depends on our ability to restrain its power to kill and lay waste. That dreadful djinn has got to be put back into its bottle and kept there.

The Atomic Energy Commission, when it is formed, may be able to throw light on what an improved atomic bomb might do. It will not be able to formulate an international control program. That program will be up to President and Congress. Mr. Truman's announcement that he would initiate discussions with Great Britain and Canada, and later with other nations, in "an effort to effect agreement on the conditions under which cooperation might replace rivalry in the field of atomic power," is a promising first step.

The President does not propose that we immediately share all that we know about atomic fission. He does suggest that we try to "work out arrangements covering the terms under which international collaboration and exchange of scientific information might safely proceed." And he intimates that any sharing we do will depend on "international arrangements" calling for renunciation of the employment of the atomic bomb. In short, we are not going to collaborate with other nations in developing a weapon with which we can all blow each other up.

Atomic energy, as the President well says, is "a new force too revolutionary to consider in the framework of old ideas." It isn't safe in any international system marked by squabbles over boundaries, bases and spheres of influences. The "old ideas" are still tragically evident. American leadership must now set to work to change them—perhaps the most critical enterprise this nation has ever undertaken.

Truman Bids World Ban Atom Power in War, Asks Federal Control in U. S.

Truman Would Negotiate for World Control if Bomb Were Renounced

Sharing of Secret Seen Conditional

Congress Is Requested to Create Commission to Develop Power in U. S.

By Jack Steele

WASHINGTON, Oct. 3.—President Truman called upon Congress today to create an atomic energy commission to control and promote the development of atomic power for peace-time uses in the United States, and at the same time disclosed that he is planning direct negotiations with Great Britain, Canada and other nations for international control of the atomic bomb.

Mr. Truman recommended that this "domestic" atomic energy commission be given full jurisdiction and control over all government-owned atomic facilities, over all mineral sources of atomic energy and over all research and industrial or commercial uses of atomic power. He urged that the commission both prevent development of an atomic monopoly and give free rein to private enterprise in atomic research and development.

While the President devoted the bulk of his 1,500-word message to Congress to the "domestic" development of atomic power, he also gave a brief preview of his thinking on the more controversial problem of international control—strongly hinting that he hopes to work out agreements through which the atomic secret can be shared with other nations under guaranties that it will not be used "as an instrument of destruction."

Seeks to Eschew Rivalry

"The hope of civilization lies in international arrangements looking, if possible, to the renunciation of the use and development of the atomic bomb," he declared, "and directing and encouraging the use of atomic energy and all future scientific information toward peaceful and scientific ends."

Asserting that international control of atomic energy could neither be left to the "slow progress of time" nor delayed until the United Nations organization is functioning, he informed Congress that he proposed to initiate discussions with Great Britain and Canada, which now share the atomic secret, as co-developers of its scientific principles, and later with unnamed other nations "in an effort to effect agreement on the conditions under which co-operation might replace rivalry in the field of atomic power."

His clearest hints of his hope to effect international control of atomic energy under which the secret can be safely shared among nations were included in these two references in his message:

1. He said that scientific opinion was "practically unanimous" that the theoretical knowledge upon which discovery of the atomic bomb was based is "already widely known" and that there is "substantial agreement" that foreign research can break the bomb secret "in time."

2. After emphasizing that the discussions with other nations will not concern disclosures of the manufacturing processes by which the bomb is produced, he added: "They will constitute an effort to work out arrangements covering the terms under which international collaboration and exchange of scientific information might safely proceed."

Tally With Scientists' Views

These views expressed by Mr. Truman coincide closely with those held by a group of scientists who participated in the development of the atomic bomb at Oak Ridge, Tenn., and those given to the Cabinet two weeks ago by Dr. Vannevar Bush, director of the Office of Scientific Research and Development and chairman of the interim commission on the atomic bomb named by the President.

The atomic scientists proposed an international commission to control the development of atomic energy, while Dr. Bush said that men of science favored plans for international exchange of scientific information including that relating to the splitting of the atom.

Many leaders of Congress, however, have expressed more cautious sentiments on revelation of the atomic secret to other nations, some of them declaring flatly that the United States, Britain and Canada should hold on to the secret.

Swift Action in Congress

Nevertheless, Congressional leaders lost no time in implementing Mr. Truman's request for a commission on atomic energy. Andrew J. May, Democrat, of Kentucky, chairman of the House Military Affairs Committee, introduced legislation to carry out the recommendation as the President's message was being read. A similar bill was offered in the Senate by Senator Edwin C. Johnson, of Colorado, ranking Democrat of the Senate Military Affairs Committee.

Representative May said his bill was introduced at the request of Secretary of War Robert P. Patterson, who advised that it was drafted by a special committee approved by the President "after several months work and consultation with leading scientists."

The President, asserting that the determination of domestic policy was the "first and most urgent step" for the control of atomic energy, proposed that Congress set

up the tightest controls ever placed over any natural resource or scientific development.

He admitted that his program might seem "drastic and far-reaching," but noted: "The discovery with which we are dealing involves forces of nature too dangerous to fit into any of our usual concepts."

He asked Congress to enact legislation fixing policy with respect to existing atomic facilities, to all sources of atomic energy and to all activities connected with atomic research, development and use in the United States. The objectives, he said, should be the "promotion of the national welfare, securing the national defense, safeguarding world peace and the acquisition of further knowledge concerning atomic energy."

Under the May bill, members of Atomic Energy Commission, to be appointed by the President with the consent of the Senate, would be paid \$50 a day while the group is in session. The commission would appoint an administrator and deputy administrator to receive \$15,000 and \$12,000 a year, respectively.

The Senate promptly engaged in a wrangle over which committee should consider the atomic legislation. Senator Johnson, a member of the Military Affairs Committee, proposed that it be referred to this committee.

Senator Arthur H. Vandenberg, Republican, of Michigan, objected strenuously, asserting that the Foreign Relations Committee, of which he is a member, had at least equal

jurisdiction. He proposed, however, that the legislation be given to a special joint committee, asserting that no standing committees provided "an appropriate forum" for discussing atomic problems.

After a heated debate, in which Democratic leaders held out for the Military Affairs Committee and Republicans back Senator Vandenberg's suggestion, the Senate put off until tomorrow the decision of where to send the Johnson bill.

PROBLEMS OF ATOMIC ENERGY

The President's message on atomic energy charges Congress with the performance of a perplexing task. Even the physicists who are all for disclosing what we know about atom-splitting, because there is no secret, agree that some control over the military use of uranium is essential. Somehow the world is to make the most of atomic energy in peace. At the same time, nations bent on making bombs by new means must be curbed. Are the peaceful and military uses of atomic energy so easily separated?

In response to the President's request, Congress will have to determine not only how traffic in uranium ores is to be regulated but traffic in "all sources of atomic energy," which means anything from clay to water. The proposed supervision of atomic research for any purpose means that Congress must deal not with a tangible weapon but with a new form of energy which may either drive a liner or wipe out a city, just as chlorine may be used to bleach paper or to poison an army. Where is the line to be drawn? Congress will have to bear in mind that the discovery of the neutron in 1932 and of the fission of uranium in 1939 not only advanced nuclear physics but prepared the way for the atomic bomb, and that no one can predict to what uses even an apparently harmless theory may be put.

Then there is the matter of "handling all information" which may lie within the jurisdiction of the proposed Atomic Energy Commission. This suggests the possibility of restraint on that free exchange of information which has been the very lifeblood of science in the past. And how far is the Atomic Energy Commission to go in forbidding the domestic production and use of materials and even in exporting and importing them, as the President suggests? Congress will have to decide whether this can be done without checking the progress of industrial and medical research. And even if some solution of all these problems is reached, what of other countries? The President emphasizes the need of international control of atomic energy. But how is international control possible without the exercise of international power?

Formidable as all these national and international difficulties are, it is vitally important that they be discussed in Congress, in Parliament and in conferences of the United Nations. If it turns out that control of atomic energy is impossible without imposing an intolerable restriction on the advance of science and on freedom of scientific expression, there is nothing for it but to consider the abolition of war itself more realistically than it has ever been considered in the past. In that case, the message of the President will have an even more far-reaching effect than he intended.

Defense Against Atom Bomb Impossible, Bohr Believes

Copenhagen, Oct. 4 (AP)—Niels Bohr, 60-year-old Danish scientist who was closely associated with the atomic bomb research, told an assembly of technicians here last night that he believed no defense against the

bomb was possible, and thus "talk of military bases is nonsense." Addressing the Engineers' Society of Copenhagen, he estimated that the U. S. can produce about three kilograms (about seven pounds) daily of uranium, the element used in the manufacture

of the bomb. Bohr explained that in order to produce even minute quantities of the element, an extensive laboratory and factory are necessary. The amount of uranium produced by the U. S., he said, gave an idea of the fantastic fac-

ories erected. "You never saw the like of it," he said. Bohr said the neutrons which bring about the explosion of the bomb have a velocity of 6,210 miles per second. He said the radioactivity at explosion was com-

parable to the effect of thousands of pounds of radium—"in fact, incomprehensible." He said he hoped the nations of the world would agree upon international control of atomic energy so that it could be used for the benefit of mankind.

Truman Asks Congress to Speed St. Lawrence Seaway Project

He Declares Power From River Is Necessary to Perfection of Atomic Bomb—Message Supports Barkley Resolution

Special to THE NEW YORK TIMES.

WASHINGTON, Oct. 3—President Truman urged Congress in a special message today to speed authorization of the St. Lawrence Seaway and power project, and emphasized that two new developments in world civilization—air power and the perfection of the atomic bomb—required this additional source of hydroelectric power.

The President said that this Government's wartime goal of 50,000 planes a year, finally surpassed twice over, and the early development of the atomic bomb would have been impossible but for the large blocks of power that had been developed along the Columbia and Tennessee Rivers.

Mr. Truman's appeal for early action on the United States-Canadian agreement followed within twenty-four hours the introduction by Senator Barkley of a joint resolution giving effect to the understanding with Canada as an international agreement. The measure is sponsored by a bipartisan committee of Senators from interested States.

2,200,000 Horsepower Planned

Describing the undertaking as one of the great constructive projects of the North American Continent, President Truman said the project would not only open up the Great Lakes for ocean navigation, but would create 2,200,000 horsepower of hydroelectric capacity to be divided equally between the people of the United States and Canada. Mr. Truman said:

"The Congress and the people of our country can take just pride and satisfaction in the foresight they showed by developing the Tennessee and Columbia Rivers and the rivers in the Central Valley of California."

"Without the power from these rivers the goal of 50,000 airplanes a year—considered fantastic only five short years ago, but actually surpassed twice over—would have been impossible. Nor could we have developed the atomic bomb as early as we did without the large blocks

of power we used from the Tennessee and Columbia Rivers.

"The timely development of these rivers shortened the war by many years, and saved countless American lives. We must ever be grateful for the late President Franklin D. Roosevelt and the wisdom of the Congress in urging and approving the harnessing of these priceless natural resources."

Mr. Truman said he had always favored the New York State Power program created under President Roosevelt first as Governor and later as President.

Envisioned for 50 Years

The President recalled that the St. Lawrence undertaking had been envisioned by the United States and Canada for fifty years under conservative and liberal governments alike.

President Truman said that this country's share in the power facilities to be developed on the St. Lawrence would be available for distribution within a radius of 300 miles, including most of New York State and its neighbor States to the East.

Public and private agencies would thus be able to pass on the benefits of cheap power to consumers in this large area, the President explained.

Mr. Truman said the project would furnish lucrative employment to many thousands and added:

"The completion of the seaway will bring many benefits to our great neighbor and ally on the north. The experience of two wars and of many years of peace has shown beyond question that the prosperity and defense of Canada and of the United States are closely linked together.

"By development of our natural water-power resources we can look forward with certainty to greater use of electricity in the home, in the factory and on the farm. The national average annual consumption of electricity by domestic consumers has almost doubled in the past ten years.

"Even with that increase the national average is only 65 per cent as high as in the Tennessee Valley, where electric rates are lower.

HT Beginning on the Atom 10/5

The President's message on the atomic bomb has the shrewd, if uninspiring, stamp of Missouri horse sense. The men who can unflinchingly pick up a red-hot potato, calmly observe that it is composed of a skin and an inside, and suggest that the skin should be confided to a strong commission of potato experts while we see, before exposing the inside, what the world may be willing to offer us for it, is obviously a valuable and level-headed public officer, even if he may be slightly lacking in imagination. Now that Mr. Truman has defined the next step in atomic-bomb policy, it is really very difficult to see what else could have been suggested. It would be useless simply to give "the secret" indiscriminately to the world—as well as technically rather difficult, since there is no one secret, but only a great mass of intricate, specific answers to a great mass of different scientific and engineering problems. To put the whole complex business of nuclear power and nuclear research under a strong scientific commission while we secure the views of the world as to what can and should be done, in the interests of humanity, about this terrible magic that we have discovered, seems an obvious solution, now that the President has outlined it.

There are two very sound elements in the President's proposals. The first is the recommendation that the whole project be removed from Army control and set up as a civilian scientific operation. The Army is simply unsuited to the peace-time control of an activity which has so many public, political, industrial and scientific ramifications. The second is the shift of emphasis from the question of "giving away the secret" to the question of securing international advice and agreement on what should be done with the thing itself. What secrets there are about the process are good for no more than a few years at most, and it is folly to suppose that we can blackmail the Russians or any one else by the threat to withhold them. It is not foolish to say to the Russians and every one else that this thing is here, an appalling menace to every civilized society; that we can greatly aid any rational proposal for controlling it by contributing the technical knowledge we have acquired, and stand ready to do so, but that, obviously, in default of any such proposal, it will be a matter of the devil take the hindmost. And we are not hindmost. Mr. Truman opens the way to such a policy. Bringing it to fruition will still be a colossal job of statesmanship, on which one Presidential message can be no more than a tiny beginning.

WORLD CURB ON BOMB URGED BY SCIENTISTS

CHICAGO, Oct. 4 (AP)—Enough atomic bombs to "cause a world catastrophe" will be on hand within a few years in several countries, the Atomic Scientists of Chicago declared today in pleading for international control of the weapon.

"The important question is not whether we should keep the secret of the atomic bomb or give it away, but what the policy of this country should be with the knowledge that in a few years from now there will be a sufficient number of atomic bombs on hand in several countries to cause a world catastrophe," the scientists asserted.

This view was expressed in a statement issued at a news conference by the executive committee of the Atomic Scientists of Chicago, an organization that claims to include in its membership 95 per cent of all the civilian scientists who worked on the project at the University of Chicago. It has no connection with the university.

"The future of atomic power is too important to become a partisan issue," the scientists declared, urging Americans to support President Truman "without regard to party affiliation in his difficult task to insure international control of atomic power."

"Scientists can see no hope of an adequate defense against the atomic bomb," their statement continued. "The only conceivable defense is not against the bomb itself but against the carrier. Complete protection against all planes or rockets which come without warning from any direction, including the stratosphere, is more than can be expected from radar or any foreseeable weapon."

Jurisdictional Row Again Blocks Atomic Energy Measure in Senate

Vandenberg Also Demands That Congress Participate in the Discussions With Other Nations on Its Use

Special to THE NEW YORK TIMES.

WASHINGTON, Oct. 4—The Senate's Administration leaders suspended today, in recognition of the evident hostility of a bi-partisan bloc, a new effort to start on its way through routine legislative channels a bill to establish a Federal commission, such as had been requested by President Truman, to deal with the atomic bomb and atomic energy.

For the second consecutive day of a dispute that ostensibly was one simply involving committee jurisdiction, any preliminary legislative action on the measure was blocked after a long and, at times, high-voiced debate between Senator Alben W. Barkley, Democrat, of Kentucky, the majority leader, and Senator Arthur H. Vandenberg, Republican, of Michigan, the leading Republican spokesman on foreign policy.

Unable to obtain agreement that the bill, which had been submitted yesterday by Senator Edwin C. Johnson, Democrat, of Colorado, simply be sent along to the Military Affairs Committee, Senator Barkley put a formal motion that would have created a parliamentary situation to that effect. At length, when some two hours of debate had made it plain that a considerable number on the Democratic side was not going to follow him, Mr. Barkley, observing that the opposition to his course appeared at the moment at least to outnumber his following, remarked that he would not insist upon "precipitating" matters.

Barkley Withdraws Motion

He added, as Senator Vandenberg sat smiling wryly, that after all it might be better to "take a day or two to think it over." He then withdrew his motion but announced that he would reinstate it next week.

Senator Vandenberg, supported in one degree or another by such Democrats as Senators Scott W. Lucas of Illinois, Allen J. Ellender of Louisiana and Carl M. Hatch of New Mexico, had vigorously protested that the subject of the control of atomic energy was too vast for any existing Congressional standing committee, urging, instead, that the whole issue be held up until the House had acted on his concurrent resolution for a joint Congressional committee to "take overall control of the consideration of this problem." That resolution already had been approved by the Senate.

The atomic problem, he urged, must be handled in this central way, or by "splitting it up and peddling it out" to half a dozen committees.

Reminded by Senator Johnson that the Johnson Bill followed Presidential recommendations, Senator Vandenberg observed sharply: "I am not in accord with that

portion of the President's message (of yesterday) which indicated that the President is going to proceed to determine what shall be the international fate of atomic energy and then report a conclusion to Congress for its confirmation.

"I think that the determination of what shall be the international fate of atomic energy goes to the utter fundamentals of the whole thing, and that the Congress of the United States should have the right of consultation from the very first moment that the subject is taken up, and again that it is necessary to create a joint Congressional voice for that purpose so that the Congressional representation can cooperate with the President every moment of the time that the subject is being explored."

Connally Sees Infringement

Mr. Vandenberg was supported by Senator Tom Connally, Democrat, of Texas, who asserted acidly that sending the Johnson Bill to the Military Affairs Committee would "infringe on the Foreign Relations Committee."

"If you want to take over the Foreign Relations Committee," he added, "don't do it by chiseling off its authority like this. I think the Military Affairs Committee might well busy itself with getting men out of the Army and demoting some of these generals. The Military Affairs Committee has plenty to do, and I hope it does it." There was subdued cheering from the public gallery at this remark. Senator Barkley contended that the Military Affairs Committee was by rule and tradition the proper body to handle the Johnson Bill and added that even if Senator Vandenberg's proposed special joint committee was already in existence it would be simply an exploratory body and not one to approve or reject legislation.

The Senate, he added, needs no more committees, suggesting that perhaps it needs even fewer.

He did not challenge the point often made by Senator Vandenberg and others that President Truman had some time ago "approved" the proposed joint committee, but took the line that it was nevertheless not intended to make incursions into the authority of the established committees.

There was privately uttered speculation that some of the opponents of Senator Barkley's plan were reluctant to have the Military Affairs Committee handle the atomic energy problem because Senator Elbert D. Thomas, Democrat, of Utah, its chairman, was deemed to be "too internationalistic." Equally, there was speculation that some Administration men did not want the projected joint committee to have any final voice lest "Senator Vandenberg run away with the ball."



The State of The Nation

Atom Bomb Suspicion Is Splitting the Allies

By Marquis W. Childs

Washington.

While he has postponed a final decision on the international use of atomic power, President Truman has made it clear that he favors some form of control through an international organization.

Long delay on this decision would be unfortunate. While the uncertainty hangs over the world, the distrust and the suspicion grow.

The choices that lie before us have been badly stated, it seems to me. Those who talk about the "secret" of the atomic bomb, and how we must keep it, are bracing themselves to resist a move that no one contemplates.

Those who urge international control of atomic power do not propose to rush out day after tomorrow and hand over the formulae to every nation in the world. That is an unfair distortion of what they propose.

The most intelligent proposal has come in the form of a bill introduced by Sen. McMahon of Connecticut, who would eventually entrust control of atomic power to the Security Council of the United Nations Organization. But before this was done, careful steps would be taken to make sure the Security Council had the right to inspect all plants and laboratories in every country of the world to see whether the agreement was being kept.

Just a Few Years

If the Council could not obtain such assurances from each nation, then, presumably, the basic information on the method of atom splitting, which still is the secret of the group that did the job in this country, would be withheld. As President Truman said in his message, the principle is no secret. And the method of blowing the world to pieces will not long be our exclusive possession—perhaps three to five years, at the most.

If we were to move toward sharing this power with the rest of the world, I believe it would do more than anything else to wipe out the cloud of suspicion and hostility rapidly forming on the

international horizon.

We should have no illusions about that cloud. Above all, it is separating East and West, separating Russia and the U. S. and Britain into opposing camps.

We are beginning to deal in hints and threats. On their side the Russians are beginning to do some hinting about atomic fission, and, as we have learned, the Russians never do anything without a purpose.

One broad hint was recently overlooked. The information bulletin published by the Soviet Embassy in Washington was devoted in considerable part, one day last week, to Russia's scientific achievements. In the course of a revealing article titled "Can Science Be Planned?" A. Joffe, director of the Physico-Technical Institute, had this to say:

Quick Finance

"By way of illustration I can cite an experience of my own in May, 1930, at a time when our country was still comparatively poor and everything was being directed towards the fulfillment of the first Five-Year Plan.

"My colleagues at the Physico-

Technical Institute and I thought it essential to begin work on the atomic nucleus. We were worried, however, because it was the middle of the year, when appropriations for our work had already been made, and the new research work we had outlined required an additional expenditure of several hundred thousand rubles.

"I went to Sergei Orjonikidze, who was chairman of the Supreme Council of National Economy, put the matter before him and in literally 10 minutes left his office with an order signed by him authorizing the sum. Once started, we continued work on the atomic nucleus for 15 years, an essential part of our plan."

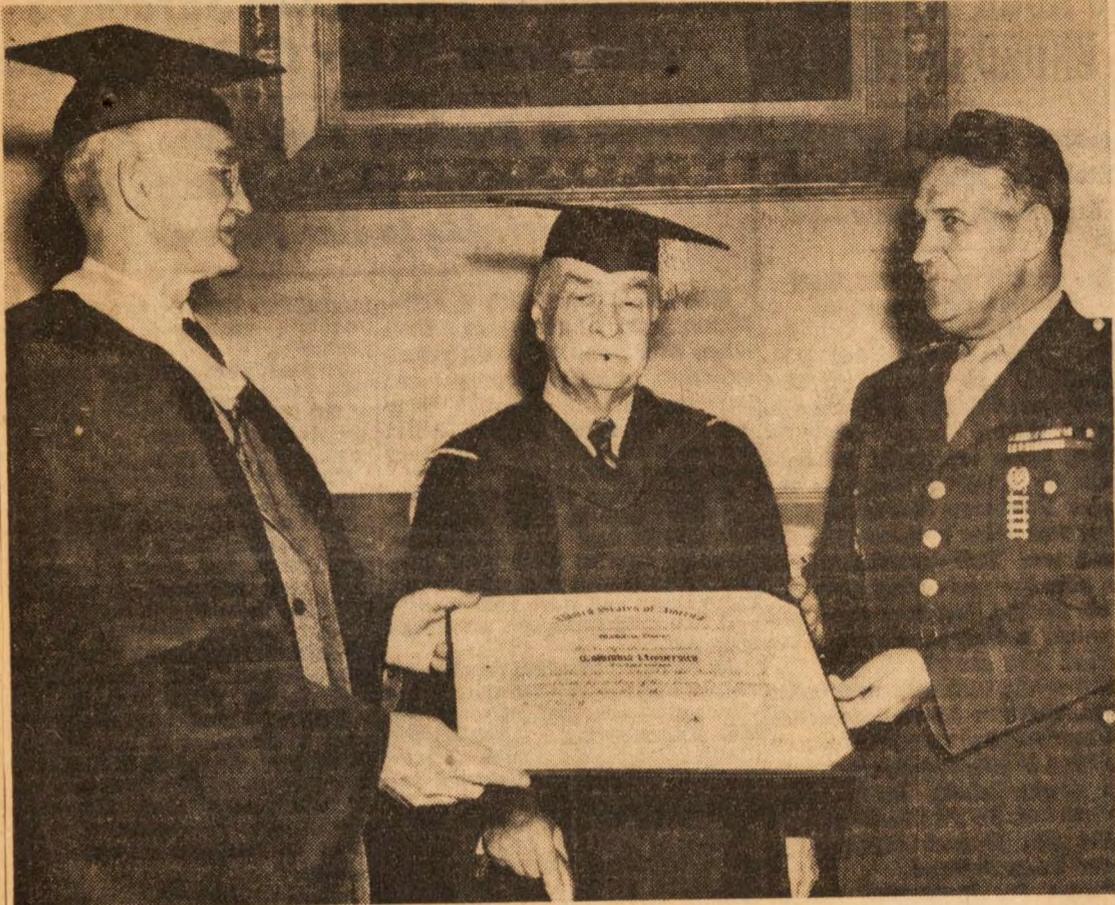
That is pretty plain. That says, almost in so many words, that Russia is a rich and powerful country geared to go to work immediately on any technical or scientific problem.

We may not believe it. But the important thing is that Russia wants us to understand just that. Suspicion feeds on itself, and will until we try to find a cure.

COLUMBIA UNIVERSITY HONORED FOR ATOMIC BOMB RESEARCH

COLUMBIA HONORED FOR ATOM BOMB AID

U. S. Scroll of Appreciation Is Called University 'Treasure' by Dean G. B. Pegram



Dean George B. Pegram (left) receiving a scroll from Maj. Gen. Leslie R. Groves during ceremony in Low Memorial Library. In the center is Dr. Nicholas Murray Butler, president emeritus of the university.

The New York Times

6.61 Pounds of Uranium Called Daily U. S. Output

By The Associated Press.

COPENHAGEN, Denmark, Oct. 4—The eminent Danish scientist Niels Bohr, who was associated with atomic bomb research, said in an address last night that the United States could produce three kilograms [6.61 pounds] of uranium daily.

The extent of American production of uranium gives an idea of the fantastic factories built there, he said, adding that "you never saw the like of it."

He also told the Engineers' Society of Copenhagen that he believed that there was no possible defense against the atomic bomb. He forecast that the difficulties in using atomic energy for peaceful purposes could be overcome.

Three universities, he continued, played major parts. It has been reported elsewhere that the Universities of Chicago and California shared in the glory.

Accepting the scroll in behalf of the university, Dean Pegram praised other universities and industrial concerns that "cheerfully let their best men join us for this work," and Columbia men and women who worked elsewhere on the project.

The scroll, prepared by the War Department and signed by the then Secretary of War Henry L. Stimson and Robert P. Patterson, Under-Secretary of War, was dated Aug. 6, 1945, the day the first atomic bomb was dropped on Japan.

Dr. Butler singled out "four men who are outstanding among our scholars" who worked on the project. These are Dean Pegram, Dr. Harold C. Urey of the Department of Chemistry, Dr. Enrico Fermi and John R. Dunning of the Department of Physics.

General Groves and Col. Kenneth D. Nichols, who supervised the Oak Ridge project, were among 105 scientists and engineers honored last night at a dinner given at the Biltmore Hotel by the Kellogg Corporation. They received gold keys engraved with a design symbolic of the project.

The Kellogg concern, a subsidiary of M. W. Kellogg Company of New Jersey, pioneered the task of developing volume production and new techniques for manufacturing materials necessary for the successful production of the bomb.

In an atmosphere marked by sharp contrasts of black academic robes and the crossed lightning insignia on the olive drab tunics of Army officers, Columbia University received yesterday official recognition of its contribution toward the development of the atomic bomb.

Before an audience of scholars, many of whom elaborated the basic discoveries that opened the Atomic Age, and supervisory military officials, Maj. Gen. Leslie R. Groves, head of the Manhattan Engineer District, presented a simple scroll symbolizing the Government's appreciation. Dean George B. Pegram, chairman of the university's division of war research, accepted it as a "treasure" for the university.

Dr. Nicholas Murray Butler, president emeritus, called it "abundant in significance as to the service which Columbia University rendered to the Government and the people in the conduct of the great war for freedom and the defense of liberty which is drawing to an historic and victorious end."

General Groves, in presenting the scroll, said the atomic bomb did not win the war against Japan.

"The war was won before it was used," he declared, "but the Japanese did not admit that fact and their resistance had not yet been overcome. American lives were being lost and many thousands more would have been lost before the war could otherwise have been brought to a close. In our enthusiasm, we must not be misled into believing that scientific discoveries and developments were solely responsible for victory. The men primarily responsible for victory were the men who actually engaged in combat with the enemy. The rest of us aided by supporting their efforts."

Thus did the man in charge of the war's greatest secret give answer to the popular notion that "the professors won the war."

Speaking afterward with reporters, General Groves asserted we defeated the Japanese at the Battle of Midway. He denied that use of the bomb was an "atrocious," terming the greatest atrocity of the war Japan's treatment of prisoners.

Only One "Defense"

Asked whether any defense against the bomb had been devised, he replied that the only real defense was "not to allow it to be dropped."

Yesterday's ceremony began like a memorial to the dead of Hiroshima and Nagasaki. To the funeral music of the university band the procession moved with measured steps to seats beneath the sun-lit dome of the rotunda in the Low Memorial Library. The Rev. Otis R. Rice, acting chaplain of the university, gave the invocation. Three hundred faculty members and students stood with heads bowed.

Relating that the first work under Government auspices that led to the atomic bomb's development began at Columbia University in 1941, General Groves said the university had continued to play a major role ever since and had "furnished the organization which developed the theoretical principles on which one of the major separation plans was designed and built."

ELEMENT 94 KEY TO ATOMIC PUZZLE

NYT 10/5
Liberation of Enough Neutrons
in U-235 Created Plutonium
Through a Chain Reaction

MATING OCCURS IN A 'PILE'

Great Heat Energy Generated in Vast 3-in-1 Power Plant— Perils, Precautions Cited

Following is the eighth of a number of articles by a staff member of THE NEW YORK TIMES who was detached for service with the War Department at its request to explain the atomic bomb to the lay public. He witnessed the first test of the bomb in New Mexico and, on a flight to Nagasaki, the actual use.

By WILLIAM L. LAURENCE

Plutonium, the man-made atomic energy element, contains, as described in detail in a previous article, two more positive charges in its nucleus than uranium; namely, it has ninety-four protons as compared with uranium's ninety-two. It has an atomic weight of 239, as compared with 238 for the common form of uranium, and thus is heavier than any of the elements found in nature.

The new element is, in fact, a great grandchild of uranium 238 and uranium 235. These two great-grandparents of Element 94, instead of being separated, are left together to mate.

The offspring of this mating is a new isotope of uranium, containing an extra neutron (electrically neutral basic unit of matter) in its nucleus, namely, uranium of atomic weight 239.

This new uranium 239 isotope is unstable. Soon, by a process known as beta-transformation, one of its neutrons loses its negative electrical charge (beta particle, or electron), thus leaving the neutron with only its positive charges, that previously had served to neutralize it. This means the neutron is converted into a proton.

Now the addition of one extra proton to the ninety-two protons in the uranium nucleus transmutes the uranium from Element 92 into Element 93, neptunium, an entirely new element not existing in nature, totally different physically and chemically from uranium.

Neptunium also has a turbulent short life time. By another spontaneous beta-transformation, one of the neutrons in its nucleus also emits a negative electron. This means that another extra proton has been added to the ninety-three protons already in the atom's nucleus—signaling the birth of another new element—Element 94.

First Produced in California

Element 93 first was produced in the University of California Radiation Laboratory in the spring of 1940 by Prof. Edwin M. McMillan and Dr. Philip H. Abelson. They were ready to begin further work to investigate the possibilities of creating Element 94 when they were called away on another secret war project.

With permission of Drs. McMillan and Abelson the work was taken up by another scientific team at the University of California, Drs. Glenn T. Seaborg, Emilio Segrè, Joseph W. Kennedy, Arthur C. Wahl and Ernest O. Lawrence, with Dr. McMillan participating in the work through correspondence.

An isotope of Element 94, of atomic weight 238, produced by bombarding uranium with deuterons (nuclei of heavy hydrogen), was produced in December, 1940. This form, however, was not useful for atomic energy. The isotope of major interest, plutonium of atomic weight 239, that yields atomic energy in amounts equal to uranium 235, was discovered in March, 1941.

This discovery opened up a host of possibilities of enormous import. Since Element 94 could be produced from ordinary uranium 238, it promised a hundred-fold increase of the total atomic energy available from uranium. Since it was different chemically from uranium, it could be separated from it by chemical means.

The question was whether or not enough neutrons could be liberated from uranium 235, in an ordinary, unseparated natural mixture of uranium, to start what is known as a chain reaction, providing enough neutrons to create plutonium out of ordinary uranium 238.

Columbia Work Cited

This question, one of the most vital in the atomic bomb project, was solved brilliantly by a team of physicists working first at Columbia University and later at the Government Metallurgical Project established at the University of Chicago. This team included Prof. Enrico Fermi, famous Nobel Prize winning physicist; Dr. Leo Szilard, Prof. Walter H. Zinn of the College of the City of New York, Dr. Herbert L. Anderson of Columbia, Dr. B. Feld and Dr. George Weil.

Dec. 2, 1942, was one of the climactic days of the atomic bomb project, and, therefore, one of the historic days in the annals of mankind. On that day, in the handball court underneath the West Stands of Stagg Field, on the University of Chicago campus, Professor Fermi and his team demonstrated that plutonium could be produced in large amounts by a special lattice arrangement of uranium and graphite.

The mating of U-235 and U-238 to produce plutonium is brought about by means of a monumental structure designated as a "Pile." Actually the "Pile" in this case is the first atomic power plant built on earth, generating enormous amounts of atomic energy in the form of heat.

In this structure, atoms by the trillions are ripped asunder, and hosts of new elements are constantly being created. These elements, products of the fission of U-235, and distinct from plutonium, are highly important by-products and will have enormous value in biology, medicine and industry.

Thus the Atomic Pile actually is a three-in-one plant. It creates large quantities of plutonium. It

creates a host of valuable new elements. It liberates vast amounts of atomic energy. No means, however, are at present available to produce this energy in a form that could be utilized.

The basic building block of the Atomic Pile is uranium metal, containing both U-238 and U-235, embedded in graphite. The uranium and the graphite are arranged in a geometrical lattice.

The graphite serves as the moderator to slow down the neutrons emitted in the process of the splitting of U-235 atoms by other neutrons. This is essential because slow neutrons are more likely to split U-235 atoms than fast neutrons.

The neutrons escaping from the uranium must pass through the graphite blocks before they can hit another piece of uranium in the lattice. In doing so they collide with graphite atoms and thus are deprived of the greater part of their energy; i. e., they are slowed down. When they are reduced to a certain slow speed the "cosmic fireworks" begin.

The process here started is a self-perpetuating chain reaction, that may be described as a "cosmic firecracker."

When the slow neutron hits the U-235 nucleus, the phenomenon of nuclear fission takes place, namely, the U-235 atom is split into two nearly equal parts that fly apart with tremendous amounts of kinetic energy in the form of heat. In the process of being split, neutron of U-235 emits other neutrons, which, after being slowed down by the graphite, split other atoms of U-235 in the uranium mixture.

Each U-235 atom split thus acts as a firecracker, starting off the next U-235 atom and the next, ad infinitum, setting off an atomic conflagration in which enormous amounts of atomic energy are liberated every second.

Chain Reaction Perpetuated

While part of the neutrons liberated from the U-235 go into splitting other U-235 atoms, and thus perpetuate the chain reaction, enough of them go into the nuclei of the U-238 atoms to form plutonium in large amounts. When a certain quantity of the plutonium is formed, the uranium is removed and the plutonium is separated by chemical procedures.

The heat produced by the energy liberated in the fission of the U-235 is equivalent to the burning of millions of pounds of coal. The energy emitted in the form of radiations is many thousands of times greater than that generated by all the radium isolated in the entire world prior to the outbreak of the war.

Such a gigantic quantity of radiation would kill any living thing in its vicinity within a fraction of a second. The Atomic Pile therefore created the greatest problem for protecting human life mankind ever had faced.

To study these new problems, and to find solution for them, a staff of several hundred of the country's leading radiologists and biophysicists was organized. Like all other major problems involved in the atomic bomb project, it was successfully solved.

The heat generated in the Atomic Pile is so enormous that if allowed to accumulate it would result in the greatest of catastrophes. Hence herculean measures had to be devised to carry off the heat at a rate never contemplated before.

To behold this atomic power plant standing there in its silent majesty, so silent that the silence itself could be heard, is one of the most terrifying and awe-inspiring spectacles on earth today.

There is not a sound heard, not the slightest hint that within this huge man-made block titanic cosmic fires are raging such as had never raged on this earth in its present form. One stands before it as though beholding the realization

of a vision such as a Michelangelo might have had of a world yet to be, as indescribable as the Grand Canyon of Arizona, Beethoven's Ninth symphony or the "Presence that dwells in the light of setting suns."

Here in the great silence one stands silent in the presence of a new form of creation. It is as though Mother Nature had "called it a day" when she created Element 92 and her "problem child" had taken up the work where she had left off.

One is reassured on seeing the most remarkable system of automatic controls, and controls of controls, devised to keep this man-made Titan from running wild. Left without control for even a few seconds, the giant would break his bonds, a super-Frankenstein on the loose.

Enormous as the mass is, its mechanisms and controls are adjusted with the fineness of the most delicate jewelled watch, and they respond with the sensitiveness of a fine Stradivarius. The slightest deviation from normal behavior and the automatic controls go into operation. They can stop the Titan in his tracks almost instantly.

Additional articles by Mr. Laurence will appear in early issues.

STORY OF ATOM BOMB TOLD

W. L. Laurence, Who Saw It Tested, Is Heard at Times Hall

"The Story of the Atomic Bomb" was told yesterday at a Times Hall

Forum by William L. Laurence, a member of the staff of THE NEW YORK TIMES, who was permitted by the Government to study the development of the bomb, as well as witness its first test in New Mexico and its actual use in warfare on the flight over Nagasaki.

In summarizing his thoughts, Mr. Laurence said he wondered whether atomic energy would become a super-benefactor or a super-Frankenstein monster. He added that the people of the world must supply the answer, which could not be given by the United States alone.

"Many of our scientists, when they first started on their investigations, were hoping that they would fail, that their labors would provide proof that the use of atomic energy in a bomb was beyond realization for the present," Mr. Laurence said. "Had they found that to be the case, they confided to me, they would have known that they had nothing to fear from the Germans. But they found the opposite. And they know today that they have only scratched the surface."

"They know that the next few years will see developments in atomic energy so far in advance of its stage of development as the modern B-29 Superfortress is of the Wright brothers' first airplane. Mr. Laurence's address was broadcast over Station WQXR. Nicholas Roosevelt was moderator at the forum.

PLUTONIUM LIFTED BY NEW CHEMISTRY

NYT 10/8

Production for Atomic Bomb
Derived From a Complex of
Unprecedented Processes

'BITS OF NOTHING' BASIS

Ultra-Micro Balance Devised
to Weigh Chemicals With
Unheard-of Accuracy

Following is the ninth of a number of articles by a staff member of THE NEW YORK TIMES who was detached for service with the War Department at its request to explain the atomic bomb to the lay public. He witnessed the first test of the bomb in New Mexico and, on a flight to Nagasaki, its actual use.

By WILLIAM L. LAURENCE

A host of formidable new problems such as science had never faced before had to be overcome not only in the production of plutonium, but also in its chemical separation from its uranium parent and in its purification and preparation for use in the atomic bomb.

It was necessary to develop an entirely new chemistry for concentrating this new element; new processes and new plants had to be designed and built. Moreover, to protect those handling this newly born livestock of "live coals" against the most dangerous radiations ever produced on earth, plants had to be designed to perform by remote control all the complicated operations involved.

When plutonium was first discovered at the University of California Radiation Laboratory in March, 1941, and the building of Atomic Piles for producing it in large quantities was first contemplated, some leaders in chemistry feared that it might take at least five years to develop the chemical methods involved. This, of course, would have been too late for use in the war.

Physicists Attacked Problem

However, when this question was put before the young group of physicists and chemists who had produced the first minute bits of plutonium, including Dr. Glenn T. Seaborg, Dr. Joseph W. Kennedy and Dr. Arthur C. Wahl, they expressed the belief that they could develop methods for chemical purification in a much shorter time.

Since no more than microgram (one-millionth of a gram) amounts of plutonium could be made by the methods then available, it became necessary to work on an extremely small scale of operation, namely, the so-called "ultra-micro scale." The first plutonium in the form of a compound was isolated on Aug. 18, 1942, by Drs. B. B. Cunningham and L. B. Werner, and a number of compounds were made as early as September, 1942. Work continued on this microgram scale of operations for about a year and a half.

On the basis of these "bits of nothing" our chemists proceeded to design a huge chemical plant to scale, the "microgram plant" serving as a "pilot plant" for actual operations some ten billion times greater in scope.

To do so they had to use a host of chemicals in exact proportions, which meant that they had to be used in quantities of micrograms and fractions of micrograms, within a limit of accuracy of 3 per cent. A human breath weighs about 750,000 micrograms, while a dime weighs 2,500,000 micrograms.

Ultra-Micro Balance Built

To achieve this unheard-of accuracy in weighing, an ultra-micro balance of an extremely high sensitivity was designed and built by Drs. P. L. Kirk and R. D. Craig of the University of California. This balance could actually weigh amounts as small as a microgram with an accuracy of 3 per cent, and could actually weigh a mass as small as 0.03 micrograms.

The material to be weighed

Makers of the Atom Bomb at Work

NYT

10/7

A reader of this department sends us copies of letters written by a young physicist who is on the staff of the Los Alamos Laboratory in New Mexico and who played his part in developing the atomic bomb. Though he cannot reveal technical secrets, he gives so interesting a glimpse of the distinguished men with whom he was associated that we publish a few excerpts:

"This laboratory is the true nerve-center of the whole project," he writes. "It is here that the scientific men, such as Fermi, von Neumann, Bethe, Oppenheimer (director of the project) and others work, and it is here that the real development goes on. The whole project at this site is divided into divisions and subdivided into groups, and the group and division leaders constitute an exclusive body known as the 'coordinating council.' I am proud to be a member of the Theoretical Division (which contains less military personnel than any other) and consider myself lucky in this respect; for our division gets the best over-all view of the proceedings."

Admiration for "Oppy"

Our young physicist has an unbounded admiration for Dr. J. R. Oppenheimer, known to his fellow-workers as "Oppy." The main decisions were all made by Oppenheimer, and all proved to be correct. "There were many cases which were subject to review by higher authorities," probably meaning Drs. Bush and Conant. "This was probably only a formality," says our physicist, "for, as usual, Oppy knows best." His right-hand administrator is Dr. S. K. Allison of the University of Chicago.

"The amazing thing about Oppy is his ability to keep in touch with detailed developments in every part of the project. It has been my own experi-

ence on more than one occasion to see Oppy come down to our office, accompanied by Dr. H. A. Bethe of Cornell (formerly of Germany), ask to see some piece of work, glance at it for a few seconds and then make some pointed suggestion which apparently had not even occurred to Bethe. In the words of one of my colleagues 'Oppy certainly stays on the ball.'"

Eminent Scientists

Never in the history of science were so many eminent scientists recruited to perform one task. Our physicist mentions among others Dr. Bethe, Dr. Enrico Fermi (Italian Nobel laureate), Dr. John von Neumann (Hungarian), Eduard Teller (Hungarian), Dr. Robert F. Bacher (American) and Dr. George B. Kistlikowsky (Russian). He thinks that von Neumann, a transient visitor, is "perhaps the most brilliant man I have ever met."

All the scientists realize what the bombs would mean in another war. They have twinges of conscience. It is therefore interesting to have this report on an address given by Oppenheimer to the members of the laboratory staff on one occasion:

"He specifically stated that he would not say one word to alleviate the fears of those of us who might feel that we had actually done a terrible thing and indicated that this should remain a problem to be solved by our own consciences. He felt, though, that we owed a great deal to the people of this country and that, at least in the short-term view of things, we had to some extent paid our debt. Immediately after his speech, which was greeted with general applause, we saw the photographs of the test-shot you must have read about."

W. K.

could be placed in containers weighing as much as twenty milligrams—that is, 20,000 micrograms.

The beam and other operating parts of this balance are constructed of fibers of pure quartz ranging in diameter from about four times that of a human hair down to fibers that are invisible to the unaided eye. The beam of the balance is a quartz fiber framework some four inches in length, which is suspended inside a brass housing on a horizontal fiber at right angles to the plane of the beam.

From each end of the beam there depends a fiber, to which is attached a quartz frame that holds a weighing pan of thin platinum foil. Objects to be weighed are placed on the foil.

The addition of a weight to one side of the balance causes the beam to be depressed on that side. The beam is restored to its initial position by twisting in the opposite direction on the fiber that supports it. It is the amount of twisting necessary to return the beam to its initial position, after the addition of a weight, that is measured and used to evaluate the weight added.

The movement of the beam is magnified by a suitable optical arrangement, and during a weighing all parts of the balance are protected against air currents.

Work continued on approximately this scale of operation until about January, 1944, at which time milligram amounts of plutonium became available. There soon followed experiments on the gram and then on the ten-gram scale. Following these the scale became substantially larger.

On the basis of these ultra-micro scale procedures a large pilot plant was built at the Clinton Engineer Works in Tennessee, where the

chemistry for concentrating and purifying plutonium was further developed under the direction of Prof. Warren Johnson of the University of Chicago, and Maj. Oswald H. Greager, formerly of the du Pont Company.

Before this pilot plant was completed, however, work began on three huge separation plants on the 430,000-acre Government Reservation near Pasco, in the State of Washington. These plants, rectangular structures hundreds of feet long, are the most remarkable chemical factories ever conceived or designed. In them enormous quantities of materials are made to go through complicated chemical processes with no human eye ever seeing what actually goes on except through a complicated series of dials and panels that enable the operators to maintain perfect control of every single operation at all times.

Each operation is performed in a remote cell behind thick walls, and when it is completed the treated material invisibly moves on to the next cell, until at the end of a series of such passages the miracle of modern alchemy emerges, ready for the next stage on its ultimate journey.

An additional article by Mr. Laurence will appear in an early issue.

ATOM BOMB FEAR DECRIED

NYT 10/8
Cripps Says Peace Can't Be Kept
by Negative Faith in Terror

LONDON, Oct. 7 (U.P.)—Fear of the atomic bomb will not prevent future wars, Sir Stafford Cripps, President of the Board of Trade, said today in a speech at Bristol.

Sir Stafford maintained that, with the passage of time, fear would grow less powerful until its influence would fade out altogether.

"That was the lesson of the previous war," he said. "We shall be building our house of peace on the most shifting of sands if we use fear as its foundations."

Fear should be replaced by a more powerful and lasting force of compulsion, he said. He challenged Christians to apply the principles of Christianity to daily life as the only hope for a new world.

The Third Atomic Blast

It is just two months since the first atomic bomb vaporized Hiroshima. A few days later, the second bomb hit Nagasaki.

The question confronting humanity is how to prevent the third atomic blast. Nobody knows where, or how soon, it will explode; so far, we have taken no concrete action to stop it.

Yet the possession of history's most terrible weapon has certainly not made Americans feel secure. We are more like a family in the London blitz which found a land mine in their backyard. If they left it alone, and did nothing about it, there was no telling how long it might lie quietly before going off. If they tried to take it out and neutralize it, it might go off in the process.

We have not even dared to take a close look to see what kind of chance we have of neutralizing our bomb. On the contrary, we have built a false sense of security on the fantastic myth that we have a cosmic "secret" which we can keep safe and secure on the shelf for six months, for two years, for three years, now we are stretching it to five years, before we have to do much about it.

The success of this soothing bedtime story about our "secret" has required that we silence our atomic scientists under a strict censorship. For conscience would drive the scientists to tell us that the atomic bomb is not a secret in principle and cannot long remain even a technical secret, that there is no defense in sight, and that there is no visible solution short of international control of uranium ore and atomic processes.

Bow and Arrow Policies

The worst immediate danger arises from the fact that, although the atomic bomb has changed the world, the world refuses to admit it.

It appears, for instance, as if international relations have rapidly deteriorated since the explosion at Hiroshima. Actually, the policies of the powers have hardly changed.

But, at the ill-fated meeting of the Council of Foreign Ministers in London, the existence of the atomic bomb acted like a pitiless cosmic searchlight showing up the wornout expedients by which we have hoped to stabilize the world between the great powers and stall off another war.

The conception of eastern European outposts for Russia seems precarious, when rocket-borne atomic bombs could reach Moscow and Magnitogorsk.

The idea of a western hemisphere defense pact and of Pacific bases shielding the United States seems inadequate, when a score or so of foreign agents might plant atomic bombs which could devastate all our industrial centers in an instant.

Yet fear and distrust accelerate the jockeying of the powers for zones of influence, for bases, for strategic defenses. At the same time, every move to retreat behind outmoded policies which offer no real security brings closer the day when some nation will believe it can only defend itself by being the first to set off the third atomic blast.

Action or Disaster

As the world federalist group led by retired Supreme Court Justice Owen J. Roberts has pointed out, the compromises of foreign policy with which we had hoped to stave off war for a generation or two cannot "carry the weight of atomic power" for even a few years.

The United Nations Organization in its present state is obsolete before it has begun to function. Several nations possess the knowledge of the atomic bomb, while the Security Council does not.

Our whole conception of aggression is outdated. The atomic bomb is the ultimate conclusion of blitzkrieg: nobody will declare war any more, and war will be over in a few hours.

It is no longer possible to check aggression after it has started. We can only prevent aggression before it happens.

We can either delay, and take a chance on a world in which the nations rush secret atomic bomb factories and face each other with their fingers on the trigger. Or we can act now to establish full and open international collaboration to control the atomic bomb and prevent its use.

Gen. Marshall, Hull and Dr. Bush Win Theodore Roosevelt Medal

The Theodore Roosevelt Distinguished Service Medals of Honor for 1945 will be awarded to Dr. Vannevar Bush, director of the Office of Scientific Research and Development and a leader in the development of the atomic bomb; Cordell Hull, former Secretary of State, and General of the Army George C. Marshall, Chief of Staff.

Announcements of the awards, which will be made at a dinner on Oct. 27 at the Theodore Roosevelt House, 28 East Twentieth Street, was made yesterday by James R. Garfield, president of the Roosevelt Memorial Association.

The medals have been given annually since 1923, except in 1941 and 1944, for distinguished service in fields associated with the career of the twenty-sixth President of the United States.

Dr. Bush, who is also president of the Carnegie Institution, Washington, will receive the medal for "distinguished service in the field of science." Mr. Hull's award is for his work "in the administration of public office" and General Marshall's is for his "achievement in behalf of national defense."

Described in the announcement as the "outstanding mathematician and electrical engineer of his time," Dr. Bush was credited with supervising the solution of problems of technical warfare, the development of new and greater weapons, the discovery or improvement of medicines for the treatment of disease and wounds and the preparation of the Army and Navy to meet any scientific menace introduced by the enemy.

Dr. Bush's principal role in the development of the atomic bomb began in 1941 when research on atomic energy was placed under his direction. The achievements of the Office of Scientific Research and Development, under Dr. Bush's leadership, were described in the announcement of the awards as providing "the greatest mobilization of scientific power in the history of the world."

Mr. Hull, who resigned as Secretary of State last November because of ill health, was hailed for his "unflagging devotion to international understanding" during the twelve years he served in the Cabinet of President Franklin D. Roosevelt.

"He worked principally in three fields—Pan-american relations, reciprocal trade agreements and international organization for the maintenance of peace," the announcement declared. "He gave substance to the President's Good Neighbor Policy toward the Central and South American republics by securing general recognition of Western Hemisphere solidarity and subsequently a practically united front against Germany and Japan in the second World War."

General Marshall was described

in the announcement as a leader who performed tasks "unprecedented in military annals."

"From a force of approximately 175,000 men he built up an Army of 8,000,000 and deployed it on all continents and across two hemispheres," the announcement said. "From a desperate war of survival he swiftly developed offensive operations, even while he trained troops for jungle fighting in the Pacific, desert combat in Africa and Arctic sentry duty in the Aleutians."

Dr. Bush is fifty-five years old, Mr. Hull, seventy-four, and General Marshall, sixty-four.

The presentation dinner, to be held under the joint auspices of the Roosevelt Memorial Association and the Women's Roosevelt Memorial Association, will mark the eighty-seventh anniversary of the birth of Theodore Roosevelt.

The last awards, in 1943, went to Mrs. August Belmont, a director of the Metropolitan Opera Association and founder of the Metropolitan Opera Guild; Jay N. Darling, the New York Herald Tribune cartoonist "Ding," and a conservationist, and Joseph Clark Grew, former American Ambassador to Japan and a former Under Secretary of State.

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10/8

THE NEW REPUBLIC

A Journal of Opinion

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NUMBER 1610

The Bomb Is No Secret

PUBLIC DISCUSSIONS concerning what to do about the atomic bomb have been hampered by the fact that information which must be decisive in our policy has not been given out. The Army very properly has put a tight embargo on data which might be of use to a possible enemy. In the process of doing so, however, it has discouraged the release of facts and opinions which do not constitute technical secrets. In particular, we have not yet heard in full concerning this matter from the scientists who developed the bomb and who know more about it than anybody else.

These scientists are naturally deeply concerned about the consequences of the terrible weapon they have produced. Both as Army employees and as citizens, they have no intention of revealing military secrets. They do, however, believe that it is of the highest importance to convey to the public through other channels than the Army, which apparently wishes to retain the bomb as an exclusive weapon of the United States, their judgment concerning that decision and the broad facts on which such a judgment must be based. The country should demand a full hearing for what the scientists who have worked on the atomic bomb have to say, at the earliest possible moment.

The scientists who worked on the various projects where the bomb was developed have independently met in their several localities, have discussed the subject, and have produced memoranda which reveal almost complete unanimity in their main points. These memoranda are being circulated among those having access to public opinion, and the editors of the *New Republic*

have been privileged to see them. We are permitted by the representatives of the scientists in question to say that the statements contained herein represent the opinions of the great majority of the men who have access to the facts.

The most startling and most significant revelation contained in these memoranda may be given in a direct quotation from one of them: "*There is no secret to be kept.* It has been known for forty years that this form of energy exists. The principles required for its release have been the common property of scientists throughout the world for the last five years. Each one of the advanced civilized nations possesses scientists capable of working out the details required for the accomplishment. Each one of the advanced civilized nations has access to some of the resources required for production of an atomic bomb."

The only important secret during the development work concerned the question whether the project could succeed. The immensely expensive and dangerous undertaking had to be based on purely theoretical predictions. Every time a minor failure occurred, the question was reopened whether the theories would operate in practice. That question has now been dramatically answered in the full view of the whole world. The only remaining secrets concern technological processes which any competent group of scientists anywhere can discover within a relatively brief time. It is a matter of only a few years at the most before all great nations can be producing atomic bombs, even if we do not tell them a single fact which they do not already know.

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The next most important judgment of the scientists is that in spite of the great publicity given to the effects of the bomb, the American public has as yet no real understanding of its terrific potentialities for destruction. What was done at Hiroshima and Nagasaki is a mere beginning. "By using more bombs, larger bombs and more efficient bombs, it will be possible in the near future completely to destroy the bulk of the population, industry and military strength of any nation within a few days. Moreover, aviation and rocket developments might enable this to be accomplished within a few hours, without possibility of effective retaliation."

There is an old military adage to the effect that for every new weapon of offense a means of defense is quickly discovered. While the scientists cannot discuss the details of possible defense against the atomic bomb, they do explicitly state that they can offer no hope of an adequate defense against it. During this war, no defense was found against V-2 rockets except to destroy the launching sites. "Moreover, the atomic bomb presents a completely new problem because a single plane or a single rocket can carry unprecedented destructive force. We might surpass by far the defensive achievements of this war, but even if we could keep nine of these missiles from their goal, dare we hope that we could stop the tenth?"

An industrial nation like the United States is particularly vulnerable to this sort of attack because of the high concentration of its industry and urban population. We might conceivably disperse our cities and put all our factories underground, but this in itself would seriously interfere with modern civilization and would offer no ultimate assurance of safety. Certainly, we could not accomplish such a huge task within five years or even a decade.

The implications of these facts for larger military strategy are obvious, and are expressed by the scientists. Any nation with a relatively small number of atomic bombs could completely destroy the war potential of any enemy. "There is no advantage in the mere possession of more atomic bombs; the advantage accrues to the nation or group which strikes first."

Industrial predominance provides no safety for the United States as long as any other nation can make the requisite number of bombs—and several undoubtedly can. The hope of averting war through superior military preparedness on the part of this or any other nation will therefore shortly vanish. The conclusion of military men will undoubtedly be that if aggression is feared, the only safe course is to destroy the potential aggressor by a preventive war. This can be accomplished within a few days or hours by a surprise attack.

If the United States, Britain and Canada expect to protect their existence by exclusive possession of the bomb, they can only do so, according to the scientists, "by destroying all vestiges of modern science and tech-

nology, including scientists, libraries, laboratories industries. This must be worldwide to be effective means the end of modern civilization." In order to force the edict, we should then have to police the indefinitely. If this sort of thing is to be our police might as well destroy humanity by a single blow.

If we do not use the power which we now possess either of these ways, but attempt to retain it as we have after other nations have been able to manufacture bombs, we shall be universally feared and the likelihood provoke a preventive war against us.

While the scientists do not regard themselves as political experts, they suggest, as well informed men, that the only possible alternative to such a world organization which can control the manufacture and use of the bomb, and turn over to it all our information while we retain an opportunity to exercise a decisive influence, is a sacrifice of national sovereignty which may be necessary to endow such an international organization with the necessary power must, in the opinion of the scientists, be accepted as a condition of survival.

The scientists leave to others the political question of the international control, but they offer a number of suggestions concerning how control can be exercised:

An International Technical Panel responsible to the World Security Council should be set up to investigate all sources of atomic materials; immediate and complete control of such materials should then be established. Provision should be made for further thorough geological surveys and extension of control to new areas; no nation not a member of the United Nations should be permitted to interfere with this program. Security must be complete and intimate. Security must be guaranteed by the United Nations. The inspections must be universal to be effective. The Council, which is to be charged with the universal dissemination of all such information, should and will be honor-bound to the observance of such regulations. It is only after the adoption of such policy as this that we of the United States can have any reasonable assurance that the nuclear bomb will not be used for our own destruction.

If the people of the world are to be able to survive within the next generation, they must be willing to trust somebody to police them. The experience with political representation in the United States does not offer sufficient assurance that we can be entrusted with such a grave responsibility.

OCTOBER 8, 1945

relatively small group of individuals might be either corrupted or deceived.

What we need is rather a numerous body of persons who would in modern terms correspond with what in more ancient societies would have been called a priesthood or a caste. Members of this body must be found in all nations. Collectively, they must have a habit of thinking and a practice of loyalty which transcend national boundaries. They must be conditioned to share what they know, both with one another and with the general public. Finally, they must have the requisite technical knowledge to understand and report upon any relevant development.

No functional group in modern society except the scientists comes anywhere near fulfilling these conditions. We have no exaggerated opinion of scientists; individuals they are subject to all human frailties even collectively they do not have universal competence or knowledge. But they are trained to cooperate with one another on an international level in their calling, and the basic item in their credo is that scientific progress belongs to the human race as a whole. We see no alternative to the proposal to entrust the future safety of the United States and of humanity to scientific fraternity, acting as an agency of the World Security Organization.

ATOMIC KEY TO LIFE IS FEASIBLE NOW

NYT 10/9
Nuclear Energy Can Be Made to Explain Trap by Which Plants Store Sunlight

INDUSTRIAL BOON COMPLEX

Peacetime Use of New Power Would Involve Less Time Than Study for War

Following is the last of ten articles by a staff member of THE NEW YORK TIMES who was detached for service with the War Department at its request to explain the atomic bomb to the lay public. He witnessed the first test of the bomb in New Mexico and, on a flight to Nagasaki, its actual use.

By WILLIAM L. LAURENCE

The question is often asked whether atomic power could ever be utilized for industrial purposes and, if so, how soon.

The answer to the first part of the question has been given succinctly by Prof. Henry De Wolf Smyth, chairman of the Physics Department, Princeton University, in the official report on the atomic bomb. "An effective heat-engine," he says, "must not only develop heat but must develop heat at a high temperature. To run a chain-reacting system at a high temperature and to convert the heat generated to useful work is very much more difficult than to run a chain-reacting system at a low temperature."

The major difficulty in the way of utilizing atomic energy for industrial power is thus the problem of attaining operation at a high temperature. While it is "very much more difficult" than operation at a low temperature, the problem is not insoluble. Problems more difficult have been solved in the development of the atomic bomb.

How soon can this problem be solved? The answer is: It depends on how much effort, in money and resources, we are willing to devote to it. With the knowledge we have gained it should take much less time to develop atomic power for peacetime purposes than it did to harness it for military use.

Practical Application Difficult

This is far from saying that the developing of means for utilizing atomic power for industrial pur-

poses will mean atomic power engines for automobiles and planes. This would require the solution of many other difficulties, much greater than operation at high temperature.

In addition to the many scientific and technological problems that would have to be solved, there are also economic and political problems that would make such a development undesirable now. It is quite certain that no government would let individuals possess atomic energy materials, even if they were rich enough to pay for them.

In the present state of world affairs atomic power for peacetime purposes must remain closely linked with its further development as a military weapon. The control of uranium and uranium ores is a major international problem facing the world today.

Every nation will from now on try to get as much of it as it can. No metal in the world's history will be so jealously guarded or sought after. Overnight this substance, which formerly sold for \$2 a pound and found few bidders,

has become the Cinderella of all the natural elements, more precious than gold or any precious stone, more valuable than platinum or even radium.

Fuel Resources Abundant

All this, however, does not mean that atomic energy can be of no benefit to mankind for the present or for the immediate future. This would be a gross misconception, arising from the fact that atomic power has been thought of as a mere substitute for coal or oil. Since our coal supply is large enough to last for about 3,000 years and the supply of oil and hydroelectric power is abundant, it would be folly to waste our precious uranium resources, even if that were not prohibited by vital factors of national security, as substitutes for cheap and abundant fuels.

Atomic energy can be utilized, and in many respects utilized right now, to supply many vital needs that could not be filled by any other form of power on earth.

In an earlier article in this series attention was called to the "hosts

of the new elements constantly being created" in the Atomic Pile, the mammoth structure in which the man-made atomic energy element, plutonium, is being produced.

"The Atomic Pile," it was observed, "actually is a three-in-one plant. It creates large quantities of plutonium. It produces a host of valuable new elements. It liberates vast amounts of atomic energy."

These new elements are by-products of the splitting of uranium 235 in the Atomic Pile. They are not promises for tomorrow. They are actualities. They could be purified in large amounts if we wanted to build plants for such purposes. They would be of immense value in industry, medicine, chemistry, physics and biology.

Undreamed-Of Prospect

These immensely valuable products could not be made by any power on earth other than by the vast amounts of atomic energy liberated in the course of producing plutonium. They are by-products. Plants for their purification would pay for themselves a thousand fold in the benefits they would produce. They open vistas hitherto undreamed-of.

Not only are new elements being created as the result of splitting the atoms of U-235 in the Atomic Pile, but also the immense volumes of radioactivity liberated in the Pile, also a by-product, could be used, to order, for transmuting hosts of common substances into new types of products, products that could not be made any other way.

With this power at his disposal man for the first time stands close to "remold his world nearer his heart's desire." The chemist, the physicist, the biologist, the engineer are on the threshold of new worlds. Instead of being circumscribed by the basic elements found in nature, they can now create new elements to order, elements that could be used for a better, richer, healthier and more abundant life.

A number of these new substances, particularly new forms of carbon, nitrogen and oxygen, basic elements of living matter, could be used to elucidate many major mysteries of life and to provide new understanding of baffling disease processes, such as cancer, for example. They could shed light on the mysterious processes involved in growing old.

Any such elucidation inevitably leads to useful application. Understanding of the causes and the processes involved in a baffling disease would likely lead to its prevention or cure. New light on the mystery why we grow old may lead to means for postponing old age.

Many of these new elements could be used as "tagged atoms," so distinguishable from common atoms of the same variety that

their course could be traced throughout the maze marking the course of their utilization in animals, plants or even bacteria. Until now such "tagged atoms" were few and available in small amounts. With atomic energy any number of them could be made in any desired amount.

Clue to Plant Mystery

With new types of "tagged atoms" now made available, a new approach can be made toward solving one of the major mysteries of nature, the process whereby plants are able, by the use of the green coloring substance named chlorophyll, to harness the energy of the sun.

Chlorophyll is the only substance known in nature that somehow possesses the power to act as a "sunlight trap." It "catches" the energy of sunlight and stores it in the plant. Without this no life could exist. We obtain the energy we need for living from the solar energy stored in the plant-food we eat or in the flesh of the animals that eat the plants. The energy we obtain from coal or oil is solar energy trapped by the chlorophyll in plant life millions of years ago. We live by the sun through the agency of chlorophyll.

So far, the processes whereby chlorophyll traps the energy of sunlight have eluded the world's greatest scientists. The process is much too complicated. By the use of atomic power, however, we can now create a new type of carbon that does not exist in nature. This carbon, a basic element used by chlorophyll in its "sunlight trap," could be traced at every step in the process. It may thus become possible to find out just how the "sunlight trap" is made.

What is more important, this may lead to the making of a "better trap." Atomic energy could thus be used, and used now, for solving another dream of the ages: to find a direct means for utilizing the enormous energy poured down on the earth every day by the sun, only a small amount of which is utilized by us indirectly through plants.

HT 10/9

Bowman's Talk to Senators

From the Herald Tribune Bureau

WASHINGTON, Oct. 8.—A partial text of Dr. Isaiah Bowman's remarks before a Senate joint subcommittee hearing on bills proposing grants of aid to science follows:

Federal support of scientific research can contribute to the destruction of liberty; or it can contribute to the safeguarding of liberty. It is futile to consider Federal support for scientific research in abstract terms; we must "think in things, not words," to use Justice Holmes' phrase. We must be explicit and clear about real ways and means, real social and political forces, and demonstrated conditions of creative thinking. I am against Federal support of scientific research if this brings political management and if the top command is to be appointed for reasons other than highest available scientific competence and political disinterestedness. I am against the central over-all direction of scientific research in the United States, for there is no man and no group of men who is competent to give such direction. The scientific brains of the United States are too diversified and too powerful to permit detailed administrative control from a single center of the expenditure of money or to permit tight business management of laboratory and field work. . . .

It was free enterprise in our laboratories, with support for special exploratory projects chiefly from private purses and foundations, that enabled us to train personnel and have it ready to the extent that it was ready for the emergency of 1941. One may well ask, therefore, why special anxiety should be felt at the present time regarding the status of American science, and why there should be any appeal for Federal support of scientific research, when the dangers of Federal control and the advantages of free enterprise in scientific research are so clearly evident.

The special situation confronting the United States today has three or four main factors that are new in our national experience. Our success in many fields of scientific discovery and in the application of discoveries to war has so vastly enlarged the range of possibilities for others that speed-up is required. And large-scale and complex scientific enterprises suited to the scale of America cannot be improvised.

The second factor springs equally from success—success at arms. The United States stands today in a quite different position from the one in which it stood in late 1918. We then had only two million men overseas and three million more in training in the United States. We openly disavowed designs on the rest of the world, we annexed no territories, we were all but blind to aviation possibilities and portents, and in the end, in effect, we even disavowed the inescapable responsibilities of our colossal powers. Today it is clear to all that World War II would have dragged on for years, or ended inconclusively, or brought defeat to those who became our allies, if it had not been for the industrial power, the abundant resources and diverse aptitudes of our people, including their capacity for organized teamwork and for sustaining the brave men who followed the long, red road to victory. . . .



Herald Tribune—Acme
Dr. Isaiah Bowman

I possess a certain temperamental optimism . . . but policy cannot rest on optimism alone. It must be based upon the hard realities of what real people are likely to do under real circumstances. The political task of statesmanship is to estimate what diverse peoples will do and to form national policy accordingly. A part of that national policy from now on, it seems to me, must be the maintenance of our military strength until we see what the world is going to be like, what philosophies may spread to the peril of America and who the men will be and what they stand for that we have to deal with in marching together, as we hope, along the pathway of co-operative endeavor in a United Nations Organization. We are not at that point in the road where co-operative endeavor is assured. We hope ardently that we shall reach that point. Until we reach it we cannot afford to ignore the lessons of this war. We must be prepared for eventualities. One of the vital elements in that

preparation is scientific power.

I confess at once that I deplore the tragic circumstances that have forced us to consider the problem of Federal support for scientific research. . . .

Remembering the dangers of yesterday and the narrow escape, and sensing the dangers that may yet arise, I must regretfully conclude that the war is not over, only the military phase of it. We have still to clear up the problems created by the war, and we are not wise enough and cannot see ahead far enough to say here and now how successful we shall be in clearing them up, or in what way we shall attempt to clear them up.

I therefore reach the conclusion that we must continue, in one form or another, Federal support for scientific research as we did in war-time. . . .

The scale of support is important. Both private and public sources are involved. There can be no question that private funds give the greatest degree of exploratory freedom. There should not be a drying up of private support. But the necessary scale of operation is so large that supplementary support from the national government is called for. . . .

A large part of the support for scientific research in our institutions has been supplied in the past by private purses and by incorporated foundations disbursing wealth derived from industry. We could afford to let such support be spotty and the broad front of scientific advance be uneven so long as our national existence and our liberties were not at stake. We now feel—and we say in our report—that certain basic parts of our research structure require increased financial support. And since it is clear that private sources cannot assume the entire burden under present tax laws, a fresh appraisal must be made of our national situation. . . .

May I return to the question of means and ends? I see inefficiency and incompetence, and both national and international disaster, if means are carelessly adopted that will destroy the great ends that I have tried to sketch and that I think the American people have in view. These are the chief reasons for saying that something new must be attempted. Do not put the proposed national research foundation in the category of just another government bureau. Do not open doors for easy appointment of untrained and worse than worthless employees who may creep into positions of control and attempt to pass themselves off as wise administrators who understand better than so-called fuzzy scientists how the job should be done. . . .

We have long assumed that if we exemplified good will the world would follow us. The world is not yet ready to follow us. The most that can be said is that the world is in training for co-operation. It has not yet reached a mature stage of co-operation. No man believes more firmly than I do in the purposes and possibilities of the United Nations Organization.

I have tried to do my part during the past four years to see this brought about. But the organization is still an infant. We are only at the beginnings of things in the field of international co-operation. We must demonstrate to ourselves and to the world that our own people have steadfastness with respect

to our declared co-operative purposes. In the mean time what winds of doctrine blow through the world outside? The dream before us is that we shall have one world. It is not one world yet. Thus two broad objects must go hand in hand: national preparedness and strength on the one hand; the co-operative spirit on the other. Thus in time, and by gradual approach we may bring the world to a common view about peace. Until that time comes we cannot afford to neglect so vital an element of national power as creative scientific research.

Langmuir Speech on Science

From the Herald Tribune Bureau

WASHINGTON, Oct. 8.—In his prepared remarks before a Senate joint sub-committee hearing on proposed bills to grant aid to science, Dr. Irving Langmuir, associate director of the research laboratories of the General Electric Company, drew a parallel between American governmental tendencies, which, he said, are destroying incentive in this country, and Russian procedures, which, he said, encourage incentive.

"In Russia," Dr. Langmuir said, "they are frankly incorporating into their Communist government the best features of our capitalist system, while we are tending to put into our democracy some of the worst features of Communism, which are now discarded in Russia. . . . We attach too much importance to security and too little to opportunity."

A partial text of his prepared remarks follows:

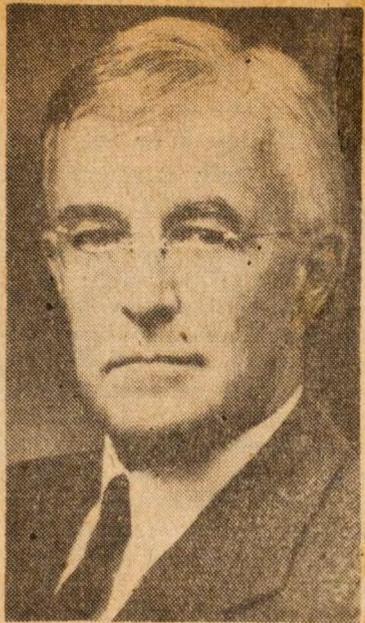
The prominent role that the United States has played in the Second World War has been possible because of certain important characteristics of the American people. I am concerned particularly with those that relate to the progress of science and industry which have been so vital in our war contribution. . . .

The atomic bomb puts upon the proposed scientific legislation an emphasis and an urgency of a new degree. I have recently attended a four-day conference at the University of Chicago on the subject of the atomic bomb. It was the overwhelming opinion that it will be only a matter of three to five years before other nations, having the requisite industrial power, will be able to construct such a bomb. There is no possibility of permanently keeping "the secret" of the atomic bomb. We thus have clearly a lead of only a few years. The important question is whether we can retain such a lead. For the future security of the world it is, therefore, vitally necessary to strengthen the United Nations organization and ultimately, through a world government, to control atomic energy for the benefit of all mankind rather than have it as a perpetual threat. In any case long range security will depend upon progress, particularly, scientific and industrial progress and of course, upon the strengthening of ties between nations making for goodwill and understanding. . . .

Pure Science Is Basis

The atomic bomb rests on a foundation of pure science carried on almost entirely in universities in many different nations over a period of years. Without this foundation all the resources of American industry, the organizing power of the Army, and the finances of the government would never have led to the atomic bomb. The unhampered, free search for truth which was permitted in universities provided the favorable conditions under which such fundamental research progressed. Without such a foundation no planning board could have brought the atomic bomb into existence. . . .

It has been pointed out in the Bush report and elsewhere that up to about 1910 the United States had already shown remarkable proficiency in developing industries upon the basis of the pure science that had been developed in other countries, particularly Germany, England and France. However, since about that time the Americans have been contributing much more than before in the field of pure science. Within the last ten years before the war America was making at least its fair share of the contributions to fundamental science.



Dr. Irving Langmuir

The remarkable expansion of American industry, which was based upon the applications in science, is well illustrated by considering the following list of industries in which the United States took a leading part:

- Railroads.
- Coal.
- Steel.
- Aluminum.
- Electrical, automobile and aviation.
- Telephone, radio, rubber and many others.

There are, of course, many factors which have made America such a great industrial country. I think that the progress resulted primarily from the many types of incentives which were active in this country. First of all, by our Constitution an unusually fine patent system was established. A patent is essentially a contract between the government and an inventor by which the inventor renounces all advantages of secrecy and publishes a full description of the invention in exchange for a limited seventeen-year monopoly. I believe that this patent system more than any other single factor has been responsible for the great industrial progress in our time.

Another important factor that has stimulated progress is that America has the pioneering spirit. We believed in men. We pushed forward into the unknown. There was keen competition among such leaders and the rewards were great. There thus grew up a system of free enterprise. I think that any careful analysis would prove that even the great fortunes amassed by Carnegie, the Vanderbilts, the Rockefellers, etc., were at a heap price to pay for the tremendous advances made by our steel, railroad and oil industries. I do not mean for a moment to argue that we should again encourage all the abuses that occurred during the early stages of the development of these industries, but I believe the abuses should have been cor-

rected without destroying the major part of the system of incentives that had proved so valuable. . . .

The system of free enterprise is part of the capitalist system. The greatest merit of the capitalist system, I believe, is the very great incentive given to individuals to forge ahead in new fields. We have learned in recent years that the capitalist system has serious defects. The greatest, I think, is its tendency toward instability. . . . It is therefore necessary to modify or control the capitalist system in such a way as to give it more stability and, above all, to prevent the threat of widespread unemployment. If we are to have continued progress and keep our lead over other nations, especially in such things as the atomic bomb, it is essential that

our modifications of the system should not stifle incentives or initiative. . . . In general, the profit motive on the part of individuals and industries has been in the public interest and has led to progress. Government control should be terminated particularly where the profit motive is distinctly contrary to public interest.

Lists Curbs on Incentives

We have inherited from our past (personal liberty, freedom of thought, free enterprise, patents, etc.) a system of incentives more effective than that existing in any other nation, but the obvious necessity of government control of some features of our capitalist system has frequently led to attacks of the capitalist system as a whole, attacks on its good as well as its bad features. Let me give a list of some of the things which are now tending to restrict or even suppress incentives. In giving this list I do not at present wish to favor or oppose any of them. I want merely to call attention to the effects they are having upon incentives.

Anti-trust laws. The tendency has been to regard all monopolies as evil, forgetting that in certain cases (telephone, railroads, etc.) monopolies are necessary and beneficial when properly controlled.

Taxation. Individual income taxes, and especially the high surtax rates, have been based on the so-called democratic principle that taxes should be paid in accord with the ability to pay. . . . A much more reasonable principle for taxation would be that taxes would be distributed according to the best public interest. With such a principle the importance of retaining incentives would be recognized. . . .

Civil service laws. Although

the public interest is well served by the application of the civil service laws to perhaps 90 per cent of the government employees now acting under them, such laws produce an almost disastrous effect on certain kinds of government projects which require men of the highly specialized training which is needed among the leaders in government scientific research laboratories. . . .

Veteran preference. It is usually fair and in the public interest to give veterans preference over others when giving employment. It must be recognized, however, that this is a type of class legislation which, in other cases, is though to be undesirable. In the research institutes, which we are now considering in these science bills, the granting of a preference to veterans may frequently lead to serious loss of efficiency and so prevent a research organization from attaining its objectives. . . .

Social security laws. Old age pensions, unemployment compensation, the "right to a job" often tend to remove incentives which would be in the public interest.

Labor unions frequently take a strong stand against piece work rates. In some cases they have insisted that both skilled and unskilled workers receive the same pay even when it means a reduction of pay of the more skilled workers. Such practices, I believe, are decidedly not in the public interest for they lead to inefficiency and the loss of incentives and freedom of opportunity to individual workers.

Attacks on the patent system. These attacks, if successful, would destroy, as I have said before, the greatest single incentive which has underlain the great industrial progress in America.

Describes Russian Plan

Incentives in Russia. I was invited to attend the 220th anniversary of the founding of the Academy of Sciences of the U. S. S. R. in Leningrad and Moscow last June. I was particularly impressed by the tremendous emphasis placed upon incentives in Russia today. Since 1931 the Soviet government has adopted the policy that the rates of pay should be determined not by a man's needs, but by his services to the state. . . .

They not only pay the industrial workers by piece-work rates, but they have especially high piece-work rates for that part of a man's production by which he exceeds his quota. The pay of the workers is represented only in a small part by the money they receive. The main part of the compensation consists of permission to buy rationed goods at low pre-war prices. Surplus money can be used only in markets or stores selling unrationed goods at prices that range from 20 to 100 times pre-war prices. Nearly everything that is essential is rationed (food, clothing, housing, cigarettes, etc.). Thus, their policy of paying a man according to his services to the state takes the form of giving greatly different amounts of rationed goods to men in different positions or having different skills. This seems to be thought of in Russia as a legitimate and desirable practice. Imagine, however, in this country what the public reaction would be if a bill were introduced into the Senate during war time giving six more times red ration points to the president of a company than to one of his lower-paid employees. . . .

Among the directors of the scientific institutes in the Rus-

sian Academy of Sciences, I found striking evidence of this incentive system. Automobiles with chauffeurs, who could be called upon at 3 a. m., were supplied at government expense to such men. One director told me that although he already has a summer home provided for him, the government has recently offered to build him another summer home in the mountains.

The incentives offered to scientists in Russia do not consist wholly of their compensation in money or in ration points. Just before the anniversary-meeting of the academy thirteen Russian scientists were awarded the much-coveted order "Hero of Socialist Labor," the highest honor bestowed by the Soviet government to a civilian.

A total of 1,400 orders of lesser degree were also distributed. In this and other ways the social prestige of outstanding scientists is increased.

The Russian government does not believe in weakening its incentive system by high taxes. There are no surtaxes as such, by excess purchasing power, while there are war-time scarcities of consumer goods, is absorbed by the very high prices charged for unrationed goods at the government operated "commercial stores," which constitute a kind of official black market. . . .

Now that the war is over the Russian government places A-1 priority on science. . . .

I believe Russia is planning to embark on a program of scientific research and development greater than that contemplated by any other government. . . .

Dr. Joffe, head of the Physical Institute in Leningrad, read a paper before the academy entitled, "Can Science be Planned?" . . .

As an illustration of planning in science Joffe says that in May, 1930, he and his colleagues became convinced that "it was essential to begin work on the atomic nucleus. We were all worried, however, because it was the middle of the year and the appropriations for our work had already been made." Although the new researches would require an expenditure of several hundred thousand rubles, Joffe was able in ten minutes to get the chairman of the Supreme Council of the National Economy to agree to the extra appropriation. "Once started, we have continued work on the atomic nucleus for fifteen years as an essential part of our plan."

Study of Russian Set-up

Comparison of science programs of U. S. S. R. and U. S. A. I am sure we in America would not like Russian methods, and I don't suggest that we adopt them. We must recognize, however, that the methods used in Russian appear to be particularly well adapted to the conditions there and they give every promise of being effective in accomplishing their avowed purposes. It behooves us to find our own American ways of obtaining equal good results. In summarizing I would like to give the following list of characteristics of the Russian system which we need to consider.

The Russians give the impression of being a strong, rough people with the spirit of pioneers. They are proud of their accomplishments during this war.

They have a remarkable system of incentives.

They have no unemployment.

They have no strikes.

They have a deep appreciation of pure and applied science and place a high priority on it.

They are planning, I believe, a far more extensive research program than we are.

In Russia they are frankly incorporating into their Communist government the best features of our capitalist system while we are tending to put into our democracy some of the worst features of Communism which are now discarded in Russia.

The pioneering spirit in the United States shows signs of dying out; we now talk about a thirty-hour week—the right to a job. We attach too much importance to security and too little to opportunity.

In 1938 and 1939 I spent some time in France. There, too, labor wanted soft jobs without much work but with increased pay and the people wanted security behind their Maginot Line, but what did get? Think of Spain, which was once one of the greatest of nations. We should pause and consider very seriously before going too far in discarding the incentives which have brought us to our present position.

Fundamental and applied research. In planning a program of this kind we need to distinguish clearly between two distinctly different types of research which we may call fundamental and applied research. The aim of fundamental science is to acquire new basic knowledge. This is inherently unpredictable—discoveries cannot be planned or foreseen.

The main contribution that government can make through the proposed foundations is to lay better foundations of pure science which can be freely used by all. Such results can best be had in universities. There are two reasons for this: first, the universities provide the ideal environment to stimulate science, and, second, the research spirit thus fostered in the university gives an inspiration to the students which is essential for the further growth of both universities and industry.

The proposed foundations of the Magnuson and Kilgore bills are also to initiate and support research and development in matters relating to national defense. Much of this work will of necessity be in the field of applied science, and many of the projects, such as jet propulsion planes or rocket missiles, will be of great magni-

ATOM VICTORY WON BY ADMINISTRATION

Sponsor Virtually Abandons Measure for Joint Group to Study Problem

By WILLIAM S. WHITE

Special to THE NEW YORK TIMES.

WASHINGTON, Oct. 8—The Administration forces in Congress, campaigning to keep within the orbit of existing and Democratically controlled standing committees the legislation dealing with control of the atomic bomb and atomic energy, won a victory today.

Representative Oren Harris, Democrat, of Arkansas, who had sponsored a resolution similar to one put through the Senate by Senator Arthur Vandenberg, Republican, of Michigan, proposing the creation of a new joint committee for "over-all consideration" of the atomic problem, in effect gave up hope for his measure.

Senator Alben Barkley of Kentucky, the majority leader, reported that he had "understood" that Mr. Harris had in fact abandoned his sponsorship of the resolution, bowing to the determination of House leaders to obtain quick passage, through the regular channel of the Military Affairs Committee, of the Administration's bill for the establishment of a Federal commission on atomic energy.

Mr. Harris did not go quite so far, but he conceded in answer to inquiries that the obvious insistence of the Administration leadership on the Military Affairs Committee's bill "might cut the ground from under" his companion proposal to Mr. Vandenberg's resolution.

Willing to Give In

"If that's the Administration plan," he added, "maybe that is best. There would in that case be no need for joint committee study. The President is understood to have made known his desire for the Military Affairs bill, and it seems that the leadership wants him to have that bill. So I don't anticipate any action on my resolution."

Senator Barkley, twice blocked last week in his effort to have referred to the Senate Military Affairs Committee and thus start on its way the companion measure to

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the House Administration bill, plainly took a more optimistic view of his chances now.

Before leaving for a brief trip to Kentucky, he said that Mr. Vandenberg's resolution would hardly come up in the Senate before the end of the week and he added that if the House, as expected, quickly passed the Administration's bill on that side, "it would at least give a very strong argument morally to the Senate to go ahead and refer its bill to the Military Affairs Committee, thus following precisely the precedent of the House."

Senator Vandenberg, on objection last week to referring the measure to that committee, had argued that in any case the whole matter should be held up until the House "had acted" on the concurrent resolution.

Basically, he complained that the subject was "too vast" for the Military Affairs or any other existing committee, insisting that Congress should approach it through a wholly new joint committee and protesting that it appeared that what President Truman actually had in mind was to make his own determination of "what shall be the international fate of atomic energy and then report a conclusion to

Congress for its confirmation." With this, he said, he was "not in accord."

BRITON IS PESSIMISTIC

Deplores the 'Extravagant Claims' Made for Atomic Energy

By Wireless to THE NEW YORK TIMES.

LONDON, Oct. 8—Britain should attach a scientific specialist to each of her embassies, so that the nation can keep abreast of trends in scientific development in all parts of the world, C. S. Garland, a leading British chemist, said tonight at a scientists' meeting that was devoted almost entirely to discussions of the atomic bomb and the effects that the release of atomic energy would have on the future of the world.

Mr. Garland told the gathering, composed of members of the parliamentary and scientific committee, that the future of atomic energy was unpredictable, but he insisted that, as scientists, "we must deplore the extravagant claims being made." Even if it is to become a new source of power, he continued, "it will make little difference to our ordinary lives for many generations."

The atom bomb and its possible

influence on international politics and economics was highlighted in the news here today. Seventeen thousand scientific workers in Britain announced a plan for sending a deputation to the Prime Minister demanding that atomic energy should be used for the benefit and not the destruction of humanity.

The scientific workers plan to ask the Prime Minister in the coming session of Parliament when the Government will be able to state its policy on the principles of political action to be followed as a result of the invention of the atomic bomb and what has been done to speed research in Britain into the industrial use of atomic energy.

An appeal for complete frankness about the future development of atomic power was made by Dr. A. V. Hill, who said that "to suppose that this business of atomic energy could remain secret for long—long enough to matter—is complete moonshine. The only hope of decent and reasonable use of what could be a priceless gift to mankind lies in frankness."

Taking an opposite view, Sir Arthur Salter, independent M. P. for Oxford University, told the United Nations Association rally tonight that he could not agree that it would be intolerable and impossible for the secret of the atomic bomb to be the permanent monopoly of one or more countries. He suggested that the United States, Britain and Canada should offer to entrust the secret to the Security Council of the United Nations on condition that each country, including those making the offer, should give the council effective rights of inspection in its territory.

tude, involving the use of heavy equipment and special metals available in industrial plants.

The nation's interest will then be served by carrying on such projects in industrial laboratories.

These laboratories are not organized to hire themselves out to any one who wants a job done and merely to receive pay for such services. The patent provisions of the Kilgore bill, which puts all ownership of the results of research in the hands of the government, if any small part of the research was paid for by the government, would usually make it impossible for the government to get industrial laboratories to accept contracts for such work. . . . If the government were to receive all rights for Army and Navy purposes and leave all commercial rights with the industrial laboratory, the government's interests would be protected. . . .

There are, however, cases where industrial laboratories might willingly agree that all patent rights should go to the government. For example, in projects such as those involving atomic energy, the rights should clearly reside in the government.

Patents Under Magnuson Bill
The Magnuson bill, by omitting

any provision on patents, places the foundation in the time-tested position of other government agencies, such as the Office of Scientific Research and Development. For each project a patent clause can be included in the contract that is applicable to the particular case considered. On the basis of the Magnuson bill the foundation would thus meet no serious patent obstacles in placing its contracts in accord with sound policies of public interest.

A word on organization of the foundation.

The Kilgore bill . . . aims at an essentially political control of science. . . .

The provisions of the Magnuson bill seem to me far better. I believe, however, that much is to be gained by placing responsibility upon scientists.

I would, therefore, like to suggest an amendment to Section 3 of the Magnuson bill by which roughly half the board members would be chosen from a suitable panel nominated either by the National Academy of Sciences, or by any group of scientists that really represent the scientists of America.

Patterson Urges Quick Atom Action To Hold Able Staff

By OLIVER PILAT
Post Staff Correspondent

Washington, Oct. 9—War Secretary Patterson today urged Congress to adopt quickly President Truman's recommendation for a Federal commission to take charge of the atomic bomb and atomic energy.

Disintegration of the staff which made the bomb, because of uncertainty over domestic policy, "would be a national disaster," Patterson told the House Military Affairs Committee.

The proposal for a nine-man commission selected by the President with the advice and consent of the Senate would be "the first step toward the determination of a sound policy for the research and manufacturing organization built up under the stress of war," Patterson said.

Gen. Groves, who had the task of carrying the atomic bomb manufacture to completion, and President Conant of Harvard University, who was chairman of the National Defense Research Committee, were present as the Secretary of War testified.

Only Domestic Control

Patterson emphasized that the bill under consideration concerned solely the domestic handling of atomic energy, since the commission would be specifically prohibited from sharing information with any foreign country without express approval from the President.

The War Dept. developed the bomb, but the development has outgrown any single department, Patterson said.

"If we misapply the knowledge we now have or fail to carry forward our research with the utmost vigor," he told the Congressmen, "we may be passing a sentence of death on the future of our own country and the entire world."

Those selected for the President's commission, he added, would have to be "men of demonstrated wisdom and judgment who would accept appointment not because of any emoluments, but rather because of a profound recognition of the significance of

Important! Read Saks-34th advertisements on Pages 6 and 14.—adv.

NY P 10/9

(Today's installment of the atom bomb story is on Page 14.)

atomic power to the future of civilization."

"We now have three enormous manufacturing plants in operation, as well as many smaller ones," he said. "We have built up a well-integrated and irreplaceable organization of scientists, executives, engineers and skilled workers."

"To allow this organization to disintegrate because of uncertainty concerning future national policy would be a national disaster. Some of our most valuable people have already left, and more will go unless prompt action is taken to clarify the situation affecting the future."

The hearings today marked opening of a partisan duel in Congress over the domestic handling of the atomic problem. Republicans in both houses are supporting a bill sponsored by Senator Vandenberg (R-Mich.) to establish a joint Congressional committee to give "overall consideration" to the matter.

Other views were heard at the opposite end of the capital.

Shapley's Views

There, Dr. Harlow Shapley of Harvard told Senate Military and Commerce Committees it would be "selfish and perhaps dangerous" to conceal knowledge about atomic research or obstruct use of the power.

Indorsing legislation to form a national research agency to keep the U. S. abreast of scientific developments, the Harvard astronomer asserted it would be "unwise to withhold for any appreciable time essential knowledge that can be of value to the whole world."

Testimony before Congress

came in the wake of President Truman's statement at Tiptonville, Tenn., last night that industrial "know how" on the atom bomb will not be shared with other countries. He acknowledged, however, that other nations will acquire—if they already haven't done so—the scientific secrets of the bomb.

SCIENTISTS BACK FEDERAL RESEARCH

Dr. Shapley, Kettering and Dr. Moulton Approve Plan for a Government Foundation

Special to THE NEW YORK TIMES.

WASHINGTON, Oct. 9—Establishment on the highest levels of a long-range program of fundamental and applied scientific research to be carried forward on all fronts with the united and energetic support of the Government and people of the country was recommended today at a joint meeting of subcommittees of the Senate Committees on Commerce and Military Affairs by Dr. Harlow Shapley of Harvard University and three officials of the American Association for the Advancement of Science.

A turning point had been reached in the career of mankind on this planet, Dr. Shapley said, and on the solution of problems confronting this and other nations largely depended not only the defense of the peace but the future of civilization.

He approved the plan for a National Science Foundation as "legislation designed in fact for the United States of America, but in spirit for the world," providing in effect a new medium for the furtherance of world-wide concentration on the solution of problems of mutual interest to scientists and technologists of all nations.

"Except in the emergency of national defense, our scientific advances should be promptly revealed to all who can profit by that knowledge, and we should systematically expect the scientists of other nations to reciprocate," he said.

Calls Scientists World Citizens

"As soon as it is emotionally possible, we should accept the principle that scientists are world citizens, serving all mankind, and working not for the past but for the future."

"It is selfish, and perhaps dangerous, to conceal knowledge or obstruct its use. And in some instances, as in the current situation with respect to atomic energy, it is in my opinion unwise to withhold for any appreciable time essential knowledge that can be of value to the whole world."

Asked by Senator Magnuson if he agreed with President Truman's announced belief that the United States should reserve to itself, at least temporarily, the engineering "know-how" which had enabled its mass production of the atomic bomb, Dr. Shapley said he assumed that was a "foreign policy statement" by the President, and as such involving matters outside his own "field of competence" for comment or discussion.

However, he added, science was coming into relation with foreign policy, since its discoveries could not long be kept secret.

"We underestimate how widespread is the knowledge of atomic energy," he declared. "It is unrealistic to talk about holding out information of that kind when others have the same basic information from which our scientists work."

He reminded the committee men that many scientific discoveries now in use came from other nations, notably from Germany, and that many of the major centers of discovery and development in Germany were now occupied by Russia, with resultant "Russian plus German" scientific achievement.

Dr. Kettering's Views

Dr. Charles F. Kettering, president of the American Association for the Advancement of Science, who is also the general manager of the research laboratory of General Motors, took issue with Dr. Shapley's estimate of the relative contribution to science of other countries, declaring that the United States had led in the electro-magnetic and other fields.

He was not excited about competition from other countries, whether Germany or Russia.

Dr. Kettering and Dr. Harold E. Moulton, permanent secretary of the association, who followed him, agreed that Government aid as provided in the pending legislation would be beneficial, but both held that it was not essential to continued scientific progress, and both urged that in the establishment and direction of the foundation, scientists should be placed in positions of authoritative control.

Dr. Howard Meyerhoff, executive secretary of the association, reported results of a survey showing that a majority of the members favored the foundation plan, all, however, insisting on the maintenance of the widest possible freedom for scientific research.

TRUMAN BACKED ON BOMB

City College Scientists Agree No Country but U. S. Can Handle It

President Truman's contention that neither Russia nor any other country besides the United States has the industrial capacity to produce the atomic bomb was supported yesterday by Dr. Mark W. Zemansky, physics professor at City College who worked for a year at the Columbia University atomic laboratories, and by Dr. William Allan, dean of the college's School of Technology.

Dr. Allan, pointing out that to produce the atomic bomb would require plants on a scale equal to those in our automobile industry, said: "It's not a matter of right or wrong, the other nations simply could not put it out."

Both educators said Russia and some other countries had very advanced scientific research workers, but as to releasing what President Truman called the engineering "know how," Dr. Zemansky said the atomic bomb was risky enough in the hands of the United States and Great Britain.

NYT 10/10

Atom Control Is Speeded By House Military Group

Committee Plans Bill This Week After Five-Hour Hearing—U. S. Lead Put at 5 to 20 Years—Experts Study Bomb Defense

By WILLIAM S. WHITE
Special to THE NEW YORK TIMES.

WASHINGTON, Oct. 9—The House Military Affairs Committee, responding to urgent appeals for Congressional approval with all speed of legislation to utterly control and nationalize atomic energy under the greatest grant of administrative power in American history, rushed its public hearings to completion in five hours today and prepared to send a bill to the floor by the end of the week.

Secretary of War Robert P. Patterson and three men closely associated with the development of the atomic bomb, Maj. Gen. Leslie R. Groves, President James B. Conant of Harvard University and Dr. Vannevar Bush of the Office of Scientific Research and Development, gravely acknowledged to the committee that the Federal Atomic Committee set up in the measure would have authority unprecedented in the life of this country.

But, they declared, nothing less would be enough with which to

confront the fabulous opportunity and immense perils of the new unknown, the atomic age, which so recently broke upon the world.

At the outset, a bipartisan attack developed on one section of the bill that would have the effect of permitting the Administration, through the President, to give to other nations the secrets of the atom bomb without the consent of Congress.

Representative Andrew J. May, Democrat, of Kentucky, chairman of the committee, made it plain informally that an amendment would be adopted to give to Congress at least some voice. He declined to say whether outright Congressional approval of any such transfer would be insisted upon, remarking only: "We will put some kind of handle on that."

Republican members, for their part, kept up a running assault during the day on other features of the measure, including those

Continued on Page 4, Column 3

ATOM CONTROL BILL SPEEDED TO HOUSE

Continued From Page 1

empowering the atomic commission to deny, without appeal to the courts, to any individual or corporation the right to work in the atomic field, and to deny to Congress itself whatever information was felt to be unsuitable for publication.

The Democratic majority, however, manifested an intention to approve the bill. Chairman May directed that executive sessions would begin tomorrow, preparatory to a vote sending the measure to the House.

5 to 20-Year Lead Seen

The testimony of the experts, General Groves, Dr. Bush and Dr. Conant, brought forth a series of conclusions and disclosures illustrating the immensity of what Dr. Conant called "the greatest discovery since the pre-historic discovery of fire," and the beginning of a new world. These included the following:

An estimate by General Groves that even with the most fortunate of circumstances "the most powerful of nations" were not likely to be able to "catch up" with the United States on the atomic bomb for a number of years, not so much because of a scientific weakness as because of a relative industrial weakness. This period of "catching up" he put at from five to twenty years.

A general prediction that atomic energy was not likely to be of any considerable commercial value for perhaps a generation, although a beginning in that connection would probably be made within ten years.

A declaration by Dr. Conant that medical "by-products" of atomic energy might reasonably be expected in the near future.

An observation by Dr. Bush that it would be less dangerous to permit the manufacture and sale of narcotics without regulation of any sort than to allow unlicensed and uncontrolled experimentation in atomic energy.

A Dramatic Rejoinder

Insistently pressed by Representative Charles H. Elston, Republican, of Ohio, to be specific in his warnings of the dangers inherent in atomic experimentation, Dr. Bush, lounging easily in his chair, at length replied, with a calm, reflective stare:

"Very well, then. For example, some fellow making uncontrolled experiments in some attic might set off enough radio-active energy to sterilize every person who passed by."

On a point mildly sore with a number of Congressmen, the authority granted in the bill for the atomic commission to present "expurgated" reports to Congress, Representative Paul Stewart, Democrat, of Oklahoma, demanded:

"Don't you think Congressmen perhaps can be trusted as well as the foreign-born professors who will be working on this?"

"My experience with both has been happy," Dr. Bush replied with a smile. He told the committee, in fact, that most of the "crucial ex-

periments" in atomic development had been performed in Europe.

In the controversy over the proposal to grant no authority to Congress to pass upon any transfer of the atomic secrets overseas, a controversy that arose in spite of President Truman's declaration that these secrets would not be given to any other country, Secretary Patterson and his associates argued that the President already had such exclusive power if he saw fit to use it.

Anti-Bomb Defense Planned

General Groves, without saying anything more definite, disclosed that the War Department scientists were "not inactive" in planning a defense against the atomic bomb, adding that the best defense was an "active" one that would not permit a bomb to be delivered against us.

Soberly he told the committee: "It is extremely important not to place our sole reliance on the atomic bomb. It would be the most tragic mistake to consider it a substitute for the Army and Navy. For someone must stop that bomb (if used against us). And someone must deliver it."

BRITISH IN CLOSE TOUCH

Attlee Says They Will Be Glad to Join in Discussions

By Wireless to THE NEW YORK TIMES.

LONDON, Oct. 9—The British Government "will be happy to participate" in discussions in the international control of the atomic bomb, Prime Minister Clement R. Attlee told the House of Commons this afternoon.

He mentioned that President Truman had expressed a wish to initiate such discussions, first with Britain and Canada and then with other nations.

Meanwhile, he continued, the British had kept in close touch with the United States Government as well as pursuing their own studies through an advisory committee recently created.

In response to another question, Mr. Attlee said that "all necessary steps are being taken to speed up research in Britain into the industrial use of atomic energy."

Sir Frank Sanderson, his questioner, then asked if, in view of developments in the United States and Canada, it was not essential that some steps should be taken in Britain to see that the British were not left standing behind in the next industrial revolution.

Mr. Attlee's reply "brought the House down."

"I can assure the honorable member," he said, "that we do not intend to be left behind in any revolution."

Mr. Attlee said nothing about President Truman's desire not to share the industrial secrets of the atomic bomb since, as the President said, the matter has not yet been discussed with the British, but there is every reason to believe that they agree with the American viewpoint in the matter.

CANTERBURY URGES ATOM-BOMB CONTROL

By Wireless to THE NEW YORK TIMES.

LONDON, Oct. 11—Only effective control by the United Nations could prevent the atomic bomb from being "the last and worst destroyer of civilized life," the Archbishop of Canterbury, the Right Rev. Geoffrey F. Fischer, declared today, opening the joint Synod of the Convocation of Canterbury here.

Dr. Fischer refused to commit himself to the suggestion for a commission to consider "the moral and spiritual implications of modern methods of warfare." He pointed out, however, that the British Council of Churches had set up a committee to consider this and other aspects of the question.

The Archbishop termed the discovery of the release of atomic energy "the event of 1945 which would most affect for good or ill the future of mankind." He said that he had received letters on the subject from a number of members of the Church of England whose positions entitled them to careful hearing.

The writers held various views. Some were clear that the attainment of no end whatever could justify the use in any circumstances of such means of indiscriminate destruction; others regretted that no specific warning had been issued either to the prospective victims or to the peoples in whose name the atomic bomb was to be used and they believed that the omission of such a warning must detract considerably from the moral value of the victory over Japan.

Others thought that, once the assumption had been accepted that war between modern States must be total, atomic warfare was only the logical culmination of what had preceded it and the scale of its destructive capacity raised no essentially new problem.

Atomic Diplomacy

IF THERE was any ambiguity about President Truman's message to Congress on atomic energy, there is none now. The President has made everything clear to the newspapermen who interviewed him at Tiptonville, Tenn.

The President had already indicated in his message that the United States would keep the "secret" of producing the atom bomb along with its partners, Great Britain and Canada. Now he has repeated the point with new emphasis.

Apparently the idea is to remind our Allies from time to time of the magnitude of our advantage. Our Allies may not be permitted to share the mysteries of atom bomb production. But they have gained new insight into our atomic diplomacy.

The United States government will mutter all the appropriate incantations of international cooperation. It will belong to the United Nations Organization. It will send delegates to various conferences.

But the object is apparently no longer to reach agreements and to keep them. That is the old-fashioned Roosevelt diplomacy. There is a new diplomacy whereby it is solemnly pledged at Potsdam to strip German industry and whereby American representatives in Germany work assiduously to break that pledge.

It was the Roosevelt foreign policy that the United States would negotiate and compromise and finally reach unity with the major world powers on the basis of common interest during

the war and a common need for lasting peace after the war.

But Secretary of State James F. Byrnes and his Republican alter ego, John Foster Dulles, have made it clear that they do not believe in this kind of foreign policy.

They propose to drive hard bargains for American imperialist supremacy everywhere in the world and to break up any conference where they do not succeed. They propose to do this in the name of the highest ethical principles. But the weapon of their diplomacy is the atomic bomb.

The four freedoms were once inscribed in bold letters on our foreign and domestic policy. President Truman's modest contribution to freedom from want in his reconversion program is under savage attack in Congress. But the President himself is destroying the hope of humanity for freedom from fear. Atomic diplomacy is diplomacy by fear.

It is true, as the President says, that there is no fundamental clash of interests between the Soviet Union and the United States. But there must be a will for cooperation and a will for peace.

On the one hand, we attempt to terrorize the world with our awful power. On the other hand, prominent Americans like Dr. Langmuir of General Electric conjure up horrendous images of Russians pushing a few buttons and wiping out the entire United States. There will be no peace that way.

They are very shrewd, the hard-boiled

strategists of American imperialism who dream of world domination with the aid of a little gadget called the atomic bomb. The whole world may pay in blood for this dream. But it is doomed to failure in the end.

Mr. Truman to the contrary notwithstanding, no nation can long keep the secret of atomic bomb production. American know-how can be duplicated elsewhere. The scientists who made the atomic bomb realize that. And no nation can hope to dominate the world. Hitler found that out.

The dream of the atomic diplomats can only turn to nightmare. But there are other dreams, the dreams shared by the people of all nations, which have the substance of reality and the possibility of achievement.

There is the dream of the scientists who have worked for years to harness atomic energy for human advancement only to see the fruit of their genius become an instrument of imperialist power politics. Their dream can be realized only by genuine nationalization of all raw materials and patents relating to atomic energy and by turning over the atomic bomb to the United Nations Organization.

And there is the Roosevelt dream for cooperation between the big powers for lasting peace. It too is a dream that can be realized, but only if an alarmed and angry nation demands the abandonment of the strategy of fear and a return to the Roosevelt foreign policy of international cooperation.

Share Atom, 17,000 British Scientists Say

By United Press

A petition signed by 17,000 British scientists and demanding that secrecy surrounding the atomic bomb be ended will be presented Prime Minister Clement Attlee Tuesday, the British radio, reported by NBC, said.

"Scientists," according to a spokesman for the group, "refuse to be pawns in the game of power politics."

THE NATION

Scientist Says Army Gags Men Who Developed Bomb

Special Correspondence

CHICAGO, Oct. 12.—A top-flight physicist who played a vital part in the creation of the atom bomb said last night that scientists are being muzzled by the War Dept. so that it can railroad atomic control legislation through Congress.

This informant, who worked on the University of Chicago project, said that his group just had been informed of the real reason for silencing them.

Up until this week, he said, they had been told that they were being muzzled because the Federal Government was negotiating with foreign powers.

The informant expressed the opinion that pending legislation relating to control of atomic energy was written by someone in the War Dept., with the admin-

istrator scheduled to be an Army man and the deputy administrator a Navy man.

Pending legislation also would clamp the muzzle more tightly on the scientists, since they could be clapped in jail for discussing with their co-workers what all of them already know, he said.

Meanwhile, the Anonymous Atomic Scientists of Chicago, which includes more than 90 per cent of the scientists who worked on the atomic energy project at Chicago U., said they viewed with concern "the possibility of hasty legislation concerning the control of future work in the field of atomic energy."

The ATS warned that "only a full understanding of the new situation will enable Congress to solve intelligently the problems which now face us." A wrong course,

it said, "could mean the destruction of our cities, death for millions of our people and the possible end of our Nation."

The group suggested that:

¶ A non-partisan committee of the Senate and the House be set up to "explore all aspects of the problem."

¶ Both open and executive hearings be held to "afford an opportunity to make available the pertinent information to members of Congress."

"The War Dept." said the statement, "has made available a wealth of technical information on how to make the bombs. On the other hand, information is not available which would enable citizens to think intelligently about the situation which now confronts the United States."

Wallace Warns Against Big Business Control of Atom

Sees Safety in International Agreements to Harness Energy

By ELIZABETH DONAHUE
Washington Bureau

WASHINGTON, Oct. 12.—Secretary of Commerce Henry A. Wallace, stressing the grave possibility of a "scientific dictatorship" in the U. S. A., has warned against putting scientists in control of any foundation or commission established by Congress to encourage research or control atomic energy.

In testimony before the Kilgore subcommittee of the Senate, Wallace predicted that the fateful decision of "one world or no world" hinges on our willingness to form international arrangements to harness the atom.

Agreeing with the majority of eminent scientists who have spoken out on the potentialities of the atomic bomb, Wallace told the Committee that "while the U. S. had the lead and can build up a stock of bombs, other nations, if they build only a third the number, can destroy all of our cities."

Opposes Langmuir

Wallace was called to testify on the controversial research foundation bill, which would provide the Government financial aid to public and private institutions for scientific projects.

The Secretary of Commerce took issue with industrial scientists, including Irving Langmuir, General Electric's research director, who seeks to pack the proposed Government scientific commission with so-called industrial scientists representing big corporations.

The experience of State and Federal Governments, Wallace said, "does not support the view that a board is any more likely to resist pressure than a responsible administrator. . . I'd be terribly afraid of the procedure of a scientific dictatorship where the board, picking the administrator, would be too far removed from the President and public opinion."

Meanwhile, a behind-the-scenes battle over atomic bomb controls—a battle extending to 90 per cent of the scientists who worked on the development of the bomb—was being fought out in the cloakrooms of Congress.

Dogged by the FBI, and virtually silenced under the threat of the Espionage Act, the majority of scientific men who worked at Oak Ridge and Chicago have discreetly wired both the House Military Affairs Committee and Senate Majority Leader Alben

Barkley (D., Ky.) that full and open hearings on atomic control are essential before a bi-partisan committee of Congress (story at top of page).

The scientists, who cannot disclose their names, entered the only protest they can against hasty action on the so-called Johnson atomic bomb bill drawn by the Army and Vannevar Bush, president of the Carnegie Institute. The bill carries a \$300,000 fine to silence all scientists on the question of atom-splitting. It attempts to lock up the so-called "secrets" of the atom bomb and places all scientists connected with it under wraps.

The bill gives an all-powerful nine-man commission (which Bush, the industrial scientists, the Army and the Navy are seeking to control) dictatorial authority to "license" every individual and company engaged in atomic research.

Included in the group protesting quick adoption of the Johnson bill, tagged as an "Administration" measure, are men whose names already are by-words in connection with development of the bombs which dropped on Japan.

'Secret' Debunked

Privately they explain that a full examination of the power and potentialities of the atomic bomb will show the public and the Congress that talk of the "secret" is purely academic.

The scientists entered their discreet protest only after the House Military Affairs Committee, at the close of brief one-day hearings went into executive session to vote on the Johnson bill. Although the Committee will not act until next week, the only amendment being given serious consideration is a GOP curb intended to prevent President Truman from divulging the atomic bomb "secret."

In the Senate the bill is getting more serious attention.

Indicative of the Senate's aware-



Secretary Wallace

ness of what is at stake is its failure after two weeks to decide what committee should undertake hearings on the bill.

Today the Senate is expected to receive a proposal by Sen. Brien McMahon (D., Conn.) to set up a special nine-man committee to conduct hearings.

McMahon, who holds that the "secret" is not a secret and in two years everyone will know about it, favors "full hearings," he told a PM reporter. McMahon discussed the Congressional confusion over atomic control with the President yesterday.

NYT
WALLACE BACKS SCIENCE PROGRAM

Secretary Tells Senate Group National Foundation Should Be Part of World Plan

By WINIFRED MALLON

Special to THE NEW YORK TIMES.

WASHINGTON, Oct. 11.—International cooperation for the advancement of science, with reciprocal exchanges of information including discoveries and developments even in the field of atomic research, but safeguarded by an effective system of inspections to prevent their misuse, was advocated by Henry A. Wallace, Secretary of Commerce, at a Senate committee hearing today on the proposed establishment of a national science foundation.

The safeguarding suggestion was offered by Mr. Wallace in a discussion with Senator Fulbright as to the relative merits of a negative or active approach to the problem of controls to be established over practical applications of atomic energy.

Testifying in support of the Kilgore-Magnuson plan for the proposed foundation, the Secretary ended by quoting with approval the recent statement of President Truman in his messages to Congress that "the hope of civilization lies in international arrangements looking, if possible, to the renunciation of the use and development of the atomic bomb."

"What do you mean by 'renunciation' of its use?" Senator Fulbright asked. "Do you think this can be just outlawed?"

Mr. Wallace replied that the words were the President's and he would not undertake to interpret them, but would say as his own understanding of them that renunciation "in order to be effective would have to be backed up with some adequate action of a very comprehensive sort."

"But renunciation doesn't convey that meaning at all," Senator Fulbright said. "That is a negative approach, such as the Briand-Kellogg Pact which renounced war. We were in the spirit of renunciation during the period of the '20s and '30s but look where we ended up. Now, the control of a positive approach to something definite seems to me to be the thing."

Mr. Wallace declined to express himself more explicitly on the subject of controls other than to insist that the decision ultimately to be made was both political and scientific.

"The politicians can't handle it unless they have the most complete scientific knowledge," he added.

On the Record

By Dorothy Thompson

Atomic Peace—and the Marshall Report

Gen. Marshall's biennial report is one of the greatest documents of this war. It is a pleasure to read so lucid a combination of thought and language.

But it is a sobering and disquieting message. The tendency of our people to regard victory as self-sustaining needs correction. We came within an inch of extinction; there is no guaranty that history may not repeat itself; there is certainly



that if it does no miracle will save us. Gen. Marshall calls for a permanent peacetime citizens' army and a great federal foundation for the promotion of scientific research. In the world as it is he is right. Strength at any and every moment is the minimum safeguard.

And yet, if war comes, even strength is no safeguard.

The most terrible thing about modern warfare is its definitive nature. No one—since antique times, has, until our own, spoken of wars of "survival." Nations have been defeated and yet flourished; they have not been thrown forever upon the scrapheap of civilizations. But the reality of our times is win or perish.

It is, of course, possible that another war would record the monomaniacal story of Moby Dick and the White Whale, in which the victor was destroyed with the death throes of the vanquished.

The Dilemma of Democracy

Both in the Pearl Harbor report and in Gen. Marshall's is implied the dilemma of democracy in today's world. The advantage is with the aggressor. If war looms one must strike first, decisively and without warning.

Gen. Marshall says—and repeats it—"The only defense against this kind of warfare is the ability to attack." Later he repeats, "The only effective defense a nation can now maintain is the power of attack."

What he does not say, but what is implicit, is "attack without warning." For the new weapons can knock out a country's power of attack in moments—or will be capable of doing so in a few years.

The United States may then have the world's largest and strongest army and industry. She will not have the power to attack without warning if she remains a democracy. That power resides only in countries under political-military dictatorship.

Gen. Marshall sincerely expresses his hope for peace through a United Nations organization. But, like our Russian ally, he does not recommend depending on it—in its present form. "If man does find the solution for world peace it will be the most revolutionary reversal of his record we have ever known," he writes, pessimistically.

Soviet and U. S.—The Crux

It would indeed be a revolutionary reversal, but if man is unable to reverse his previous record in the face of the huge reversal of his previous possibilities, for life or death, then Shakespeare's words will come true: "the great globe itself, yea, all which it inherits, shall dissolve, and, like this insubstantial pageant faded, leave not a rack behind."

At present, the world is divided between two great powers: The United States and the Soviet Union. It will not matter for Great Britain who wins any future war. No country except the United States could dare a war with the Soviets; no country except the Soviets could dare a war with the United States.

The crux of the future peace thus lies in relations between the United States and the Soviet Union. Little is being done to

improve these relations from either side. To assess blame gets us nowhere; the blame lies in the lack of imagination of both. The Russians will have no "security zone," if five or ten years from now, we should attack them without warning. We would have no security zones if the reverse should occur.

Control Is the Answer

Fear lies at the root of all unwisdom. But there is a way out. It is easier for the mind of man to find the secret of what causes the sun to shine. It does not lie in "trust," "cooperation," or "consultation"; it lies in control—not diplomatic control, but technical control.

The United States should immediately offer the Soviet Union a federative military alliance—and offer it at the same time to all nations on earth. It should offer to defend Soviet territory against all attacks, asking the same in return.

It should offer the Soviet Union access to all our scientific knowledge, in return for one restriction: An international commission reporting to the Security Council and largely composed of scientists and technicians from all nations, and especially the small ones, must have access to every Soviet plant and war installation as it should have access to those of America and every other nation. It must thus be made impossible not only for other nations, but especially for the Big Three, to go to war against each other, by attack without warning.

Force Based on Peace

We have talked about peace based on force. There is no such thing. There can only be force based on peace. Peace means control. Control cannot be left to the whims of "sovereign" states, nor to conferences of foreign ministers, nor to security councils.

The United Nations needs all that Gen. Marshall recommends to make it highly advisable for nations, in their own interests, to bring the San Francisco Charter into line with reality.

We must begin, I repeat, at the central point of greatest danger—we must offer, not an "agreement," but a control plan to the Soviet Union.

Wallace Backs U.S. Agency for Scientific Study

Imminent Discovery of an Atomic Bomb Defense Is Hinted at in House

By Stephen White

WASHINGTON, Oct. 11.—Secretary of Commerce Henry A. Wallace expressed today his approval, point by point, of a bill under consideration by a Senate joint subcommittee designed to grant large-scale Federal aid to science and scientific research.

In the House, the Naval Affairs Committee reported vaguely the imminent discovery of a defense against the atomic bomb while the Military Affairs Committee continued consideration of the far-reaching atomic energy bill and adjourned until Tuesday with half the bill cleared.

Unlike previous witnesses, all of whom have voiced general approval but found one specific clause or another to their distaste, Mr. Wallace had nothing but good to say of the tentative bill, which was drawn up for committee use by Senator Harley M. Kilgore, Democrat, of West Virginia, and Senator Warren G. Magnuson, Democrat, of Washington.

"I unqualifiedly indorse Federal support of scientific research activity, including the social sciences, and of technological development," he began in his testimony before the committee. The patent provision, which would make most results of government-aided research free to the public, but would leave leeway for those cases where such action would work hardship on an individual or company, he found "a satisfactory solution to a difficult problem."

He had equally kind words to say for the administrative organization laid down under the bill, by which the director of the proposed organization would be appointed by the President and answerable only to the President, although provided with an advisory board. Such an organization, he said, had been found in his experience to work well. To criticism that politics would thus be brought into the work of the board, he replied, "No agency with public powers and which spends public funds should be insulated from politics."

The recurrent statement that a defense against the atomic bomb is in view was made in the course of a proposal by the House Naval Affairs Committee for a post-war Navy of 1,082 combat vessels of all sizes, including 297 major combat vessels.

"There can be no question," the report said, "that the atomic bomb is the most destructive force yet devised by man. But history shows that the science of warfare has always developed an effective counter-measure for every new instrument . . . knowledge of electronics promises ability to detonate atomic bombs at great distances by radio."



I'd Rather Be Right

By Samuel Grafton

The sight of Congressional committeemen hanging hungrily on to the words of a number of college physicists these days is amusing to those of us who have good memories. It has not been so long since the term "professor" was an epithet in Congressional debate, and there were Congressmen who could say "bureaucrats and professors" in one swift and bitter exhalation, as if it were a single term of opprobrium. Those were the days when the administration was criticized for "listening to college professors"; the great, sad days of our primitivism, when it was considered rather disgraceful to use long words, and somehow honorable and manly not to know their meanings.

Revenge of the Meek

Well, the atomic bomb has blown this up, among other things, and now, when a professor of nuclear physics walks through the Capitol, Congressmen are inclined to pick bits of fluff from his sleeve, and to dust chairs for him. It is like the final chapter in one of these Clarence Budington Kelland stories, in which the meek little pedagogue turns out to be one hell of a guy. The Congressmen stare at the high foreheads, and feel in their hearts the helplessness of those who do not know how to split an atom.

This is like a revival of learning, a kind of renaissance. The President, and almost everyone else in the forum, is briskly asking for funds for research, and the Army itself, like Congress, woos the shy little men in rubbers; General Patch, who is planning our postwar military establishment, interviews scientists to get tips on what the army of the future will have to do, and be.

You could, currently, pack any luncheon club meeting to the doors with even a second rate physicist as speaker of the day, especially if he would bring some apparatus along to demonstrate to the audience how there is enough energy in an ocean liner to drive a match-stick five times around the world, or whatever.

A Kind of Renaissance

But though a renaissance is on, it is a curiously lopsided renaissance, and, as such, it is beginning to worry the men of science themselves. The new interest in learning applies only to atomic research, for example; professors of economics and sociology are still bums, so far as many a Congressman is concerned, especially if they show unhealthy interest in public housing, or power development in our great valleys. Congressional admiration is reserved solely for nuclear physics.

And a feeling is growing among scientists in this field that they are not only being admired, but that they are, in a sense, being taken over, body and mind; they have become our armorers, and, as armorers, they are becoming the property of the state, fenced in, and set apart. They don't mind that, so much, in itself, but with it goes the troubled feeling that they are now in the control of statesmen who are perhaps not equipped to make the decisions involved.

Or Maybe Not

An "Association of Oak Ridge Scientists" has already been formed, described as comprising most of the experts who worked in the Tennessee atomic plant. It has stated that we can't make a monopoly of the split atom; that other nations will duplicate our work; especially since they now know the thing can be done, a useful bit of knowledge in itself, and one which we didn't have when we started. These scientists say the real problem is to set up an international authority to make atomic knowledge safe; but Congress does not care for their political advice, it likes them only as the Vulcans of the new age. Even scientists who have not joined in the demand for a world atomic authority, such as Dr. Samuel K. Allison, of Chicago University, chafe at the curious vista of government-owned science which lies ahead, and want to go back to free research. Says Dr. Allison: "We have been virtually locked up ever since we started, and we don't like it."

So maybe there is no renaissance, after all; and perhaps we are still being primitive, desperately trying to lock up what cannot be locked up. It is a kind of illiteracy to use learning itself in an illiterate fashion; and suddenly it seems to come clear that our thinkers have not yet won their battle with the unthinking, and that the fight has just begun.

NYP 10/12

Atom Bomb Peril Alarms Canterbury

London, Oct. 12 (Reuter)—Use of the atomic bomb is causing profound unease to Christian conscience, the Archbishop of Canterbury declared before a full synod yesterday.

"The question is whether the nations can control it to beneficent uses, or whether it is to be the last and worst destroyer of civilized life," he said.

The Archbishop read extracts from a letter by members of the Church of England whose positions, he said, "entitle them to most careful hearing." The letter

said regret was felt by the writers that no warning was issued "to the prospective victims of the bomb or to the peoples in whose name it was to be used." They believed that the omission of such a warning detracted considerably from the moral value of the victory over Japan.

ATOM BOMB DEFENSE INDICATED BY NAVY

NYP 10/12

House Group Report Envisions Detonation of Missile at Great Distance by Radio

By The Associated Press.

WASHINGTON, Oct. 11—Congress got from the House Naval Committee today the first definite ray of hope for a defense against the atomic bomb.

How near that hope is to actual achievement went carefully unrevealed, but the idea is to explode the agencies of wholesale death by radio over the ocean before they get to the United States.

The committee, which has been conferring recently with high naval officers, said:

"There are indications that an effective counter measure to atomic bombs has been developed to such an extent that they can be exploded far short of their objective without the necessity of locating their position.

"Knowledge of electronics promises ability to detonate atomic bombs at great distances by radio. Such interceptive defense can be

Continued on Page 5, Column 3

THE

ATOM BOMB DEFENSE INDICATED BY NAVY

Continued From Page 1

affected at the greatest distance from our shores by the Navy."

Numerous scientists who were associated with the development of the bomb have said, even in recent weeks, that they knew of no defense.

The House group put out its report on atomic bomb defense to emphasize its feeling that "we cannot scuttle our Navy but rather we must maintain the world's most powerful Navy intact."

"The atomic bomb is still a bomb requiring land planes or carrier-based planes to deliver it," the report added. "The best offense against it is intercepting air power."

Bohr for World Control

WASHINGTON, Oct. 11 (U.P.)—Niels Bohr, the Danish scientist who was whisked from the Nazis' grasp to help develop the bomb in this country, contended in a science magazine article that atomic energy and all other awesome scientific developments must be subject to international control.

Mr. Bohr, who played a substantial part in developing the atomic bomb, said that the need for controlling atomic energy offered a chance for strengthening international cooperation.

"Indeed, the crisis with which civilization is at present confronted should afford a unique opportunity to remove obstacles to peaceful collaboration between nations and to create such mutual confidence as will enable them jointly to benefit from the great promise, as regards human welfare, held out by the progress of science," he wrote.

The House Military Affairs Committee meanwhile recessed until next Tuesday without acting on a bill based upon President Truman's request for a nine-member commission to govern all phases of domestic research and production of atomic energy.

Did Not Win War, Groves Says

DECATUR, Ill., Oct. 11 (U.P.)—Maj. Gen. Leslie R. Groves, head of the Army's atomic bomb project, said today that the atomic bomb did not win the war against Japan and could not be depended on for insurance against future wars.

"The atomic bomb did not win the war—it stopped it abruptly," General Groves said. "It would be unsound to depend on it as the final defense against war."

General Groves said he agreed fully with President Truman that the secret of the atomic bomb should be kept in the United States.

BILL FOR ATOMIC CONTROL IS EXPEDITED IN CONGRESS

Mood Seems to Be to Keep the Secret Closely, Letting Out Nothing

NYT 10/14
By WILLIAM S. WHITE

WASHINGTON, Oct. 13—Congress set out this week with anxiety and even foreboding on a task unique in the parliamentary history of the world, an attempt to control the well-nigh uncontrollable, atomic energy and the atomic bomb.

An Administration bill to set up a Federal Atomic Commission, with powers unprecedented in the life of this country, to nationalize atomic energy as nothing had ever been nationalized here, was all but hurled along in its first test before the House Military Affairs Committee. Public hearings were begun and concluded within five hours; all preparations were made to speed the bill along in the coming week.

Problems of almost indescribable complexity faced the House and likewise the Senate where a companion measure is pending, in the strange new age, which, like a rolling of infinite thunders, suddenly encompassed the world when the first atom bomb fell upon Japan.

There was first the high necessity, acknowledged in both parties, of somehow taking into Government hands the power of the atom, with all the frightful dangers to the public safety that the expert witnesses agreed would be inherent in any uncontrolled experimentation.

Divergencies Appear

Next was the determination on all hands that atomic energy as a military weapon must be guarded and husbanded primarily for the good of this country and its essential corollary, the peace of the world. At this point there began to be divergencies. For some wanted no other country, in any circumstances now foreseeable, to be told the inner mysteries of the new bomb. Others thought more in terms of an internationalization of the weapon. President Truman said that we would not give our secrets to any nation.

And then arose what was to many the most frightening prospect of all: the condition, put forward by such witnesses as Secretary of War Robert P. Patterson and President James B. Conant of Harvard University, that only a grant of administrative power, vast

beyond anything in the history of this Government, would be enough adequately to direct this fearsome force.

The Administration bill in original form would make it possible for the Administration, through the President, to give the atomic bomb to some other nation without the leave of Congress. It would, by the tacit admission even of some sponsors, put into the hands of a "bad" commission tremendous opportunities for discriminations and other evils.

Some Checks Foreseen

The outlook at the end of the week was that some sort of Congressional check upon the Administration's power to deliver up the atomic bomb would be written into the bill, but that otherwise the authority finally granted was going to be in a category all its own.

But by and large Congressional opinion was in a state of inquiry, not a state of decision. With this qualification: The mood for clutching the secret tightly, rather than for letting out a single phase of it, appeared wholly predominant.

And on this point Maj. Gen. Leslie R. Groves, who was the Army's administrative head for all the work that at length produced the atomic bomb, told Congress that the really great "secret" of the bomb was no secret at all. It was not so much a question of a superior American scientific brain, he said. It was in large part the superiority of American industry, management and labor.

It was these factors, worn with pleasant familiarity, to which more than all others he attributed the present American pre-eminence and a fair prospect that this country would remain ahead, at least to a degree.

At least, he hazarded, it would take the "most powerful of countries" from five to twenty years to "catch up"; and in the meantime, in both the aspects of offense and defense, this country would not have been idle.

It was thus that a Congressional debate opened, although in scarcely more than its first stirrings, upon a vista now terrifying, now reassuring, now infinitely alien and now agreeably commonplace.

For Atomic Control

NYT 10/14
The Frankenstein possibilities of the atomic bomb—characterized by one scientist as the "greatest discovery since the pre-historic discovery of fire"—were matters of increasing debate and concern last week. In the town of Tip-topville, Tenn. (where he vacationed on a lake formed by an earthquake in 1811) President Truman declared that the remaining secrets of this new American-made earthquake will be guarded. Pointing out that the scientific basis for the atom bomb is now common knowledge, he said the all-important engineering "know-how" for the bomb's manufacture is American and will not be disclosed to other nations. He added that none of the Allied nations has asked for the secret. Coupled with strong opposition in Congress to internationalization of the bomb, his statement seemed to settle the question of whether Russia is to be given the full details of manufacture.

At the same time Congress swung into action to provide the domestic controls over atomic power that the President has requested. Last week the House Military Affairs Committee rushed through its public hearings and prepared to report out within a few days a bill calling for the greatest grant of administrative power in American history. The Senate, involved in argument over what committee should have jurisdiction, moved more slowly. Following the general lines of legislation recommended by the President, it provides for a nine-member commission to regulate and completely nationalize all research, development and operations in the field of atomic energy. Some Congressmen were apparently shocked by the scope of authority planned for the commission. In answer, Secretary of War Robert P. Patterson and three experts closely connected with the development of the bomb pointed out the gravity of the situation. Said one: "We're flirting with national suicide if this thing gets out of control."

From the discussion in Congress and elsewhere a series of dramatic disclosures and conclusions were made public. They included: (1) the statement that private, unregulated experiments with the atom would involve great danger to whole communities; (2) the estimate that atomic energy was not likely to be of any considerable commercial value (except medically) for a generation; (3) the assertion by some scientists that no adequate defense against the bomb exists (which was disputed by a Navy claim that an effective radio counter-measure to explode the bombs en route has been developed); (4) an estimate that "even the most powerful nations" are unlikely to catch up with the United States on the atomic bomb in from five to twenty years; (5) the belief that if and when another nation forges ahead of the United States on atomic research it might be able "by pressing a button" to wipe out American cities and much of the population.

For Continued Research

To many these conclusions held a warning that the nation cannot afford to relinquish its lead in science and industry in the slightest degree. That view was reflected in the recommendation by several outstanding scientists, before a joint Congressional committee, for the establishment on the highest levels of a long-range program of fundamental and applied scientific re-

search with the energetic support of the Government.

The same set of factors, however, led many scientists—including a number who warned against any slackening of the American effort—to a different conclusion on what to do about the secret of the bomb. They urged international control as the only alternative to the threat of mass extinction. Pointing to the belief that Russia and perhaps other nations will sooner or later be able to produce the bomb, they warned that fear of retaliation would be no deterrent to a sudden crippling blow.

400 EXPERTS DECRY LONE ATOM POLICY; SEE 'UNENDING' WAR

NYT 10/14
Los Alamos Scientists Assert
Efforts to Keep Bomb Secret
Would Be Disastrous

HOLD U. S. IS VULNERABLE

Control by World Authority Is Demanded—Real Defense Is Regarded as 'Uncertain'

By The Associated Press.

LOS ALAMOS, N. M., Oct. 13—Foreseeing atomic bombs "thousands of times more powerful" than those dropped on Japan, 400 scientists who helped develop the weapon at the Government's laboratory asserted in a statement today that to try to keep it from the rest of the world "will lead to an unending war more savage than the last."

Released by Dr. Robert R. Wilson, member of the executive council, on behalf of the Association of Los Alamos Scientists, the statement set forth these points:

- (1) It is certain that nations other than the United States, Great Britain and Canada by research can produce atomic power.
- (2) This nation's highly concentrated industrial centers make it particularly vulnerable to such a weapon.
- (3) Counter-measures would be "extremely difficult and uncertain" because of "the concentrated form of destructive energy" and "the large number of possible methods of delivery."
- (4) Advantage would lie with the aggressor. "A single heavy attack, lasting a matter of minutes, might destroy the ability of a nation to defend itself further."
- (5) The bomb is "a deadly challenge to civilization itself."
- (6) "The use of atomic energy must be controlled by a world authority."

Demand Cooperative Policy

In disapproving suggestions that the United States, Britain and Canada assume unilateral control over atomic power development, the scientists said that they could not conceive of such a policy's leading to "a stable, peaceful world." They declared that "we must cooperate with the rest of the world in the future development of atomic power," and added:

"It is certain that other countries by independent research can achieve the technical design and industrial methods of producing atomic power which now are the secrets of the United States, Great Britain and Canada.

"Before many years they may also be manufacturing bombs—bombs which may be tens, hundreds or even thousands of times more powerful than those which caused such devastation at Hiroshima and Nagasaki. * * *

"It is particularly difficult to develop counter-measures that would provide a sufficiently large proportion of interceptions of high-speed missiles of the V-2 type, such as recently described by General Marshall."

Expressing the belief that international control was technically feasible, the scientists said that "abolition of secrecy in national and international relations may be necessary," providing free access to "all laboratories, industries and military installations."

"The actualities of the situation require a drastic solution, and the

atomic bomb is a sufficiently revolutionary force to impel us to such a solution," the statement said.

"It was our hope in developing the bomb that it would be a great force for world cooperation and peace * * *

"Effective action is impossible not only when other nations have atomic bombs but even when programs for their manufacture are under way. Lack of decision within even a few months will be preparing the world for unprecedented destruction, not only of other countries but our own as well."

Group Assails Defense Report

CHICAGO, Oct. 13 (AP)—The newly organized Atomic Scientists of Chicago said today that "expert scientific opinion" contradicted a report issued Thursday by the House Naval Affairs Committee, which said "indications" were that "an effective counter-measure to atomic bombs has been developed."

The report said that the bombs could be exploded "far short of their objective without the necessity of locating their position" and that "knowledge of electronics promises the ability to detonate atomic bombs at great distances by radio."

The Chicago group, claiming to represent more than 90 per cent of the civilian scientists who worked on the atomic bomb project at the University of Chicago, said in a statement that "it is to be regretted that the Naval Affairs Committee has seen fit to issue such highly misleading statements relating to control of atomic missiles."

"The atomic bomb is a weapon of terrible destructiveness," the scientists said. "Reports such as this one which attempt to minimize its importance and convey the impression that the armed forces will soon bring the situation under control can do incalculable harm."

The statement was released through the group's seven-man executive committee, which declined to disclose the names of its members.

May Refuses to Reopen Hearings

Special to THE NEW YORK TIMES.

WASHINGTON, Oct. 13—Chairman Andrew J. May of the House Military Affairs Committee refused today to reopen its hearings on the Administration bill to control and nationalize atomic energy and the atomic bomb.

The Kentucky Democrat acknowledged the criticism of a number of scientists and others of the fact that public discussion had been limited to a single day, but he insisted that "not a single scientist" asking to be heard had not had that privilege.

All committee witnesses, Mr. May declared in a written statement, were "permitted to go just

as far as they thought wise as to the secrets involved."

"In fact," he added, "the committee was extremely vigilant in its search for information, as well as discreet in its inquiries to the witnesses."

As to protests of the scientists, Mr. May asserted that "the three top scientists dealing with the secret details" of the atomic bomb—Dr. Robert J. Oppenheimer, Dr. Enrico Fermi and Dr. Ernest C. Lawrence—had in fact sent to Secretary of War Robert P. Patterson from New Mexico a telegram wholly endorsing the administration bill and warning against "delay."

This message, as given out by Mr. May, read as follows:

"We would most strongly urge the prompt passage of the legislation now before Congress for the creation of an atomic energy commission. We know from our close association with the actual work in this field that delay will cost us heavily in efficiency, in accomplishment, and in spirit. We believe that with wisdom operations can be carried on within the framework of the proposed legislation safely, effectively and in the best interests of this nation.

"We believe that the broad powers granted the commission by the legislation are justified by the importance and the perils of the subject. We think it necessary for the American people to understand in full the implications of the new technical situation.

"But we believe that the proposed legislation will make it possible for their desires and decisions to be responsible and fully implemented. We assure you that in our opinion the legislation as presented represents the fruits of well-informed and experienced consideration."

Without commenting on the demands coming from some members of the left wing of the Democratic party for further open committee discussion, Representative May declared:

"The hearings having been closed, the committee has almost finished amendments to the bill and no further hearings will be held."

He thus held fast to a previous committee decision to try to bring the bill out by Wednesday. Although his decision could be overturned by a contrary committee vote, this was deemed unlikely.

Canal Defense an Issue

WASHINGTON, Oct. 13 (UP)—The defense of the Panama Canal against the atomic bomb will be put up to Congress next week, it was learned tonight.

Maj. Gen. Joseph C. Mehauffey, Panama Canal Zone Governor, is en route here to ask Congress for quick action to protect this country's vital short-cut between the Atlantic and the Pacific.

General Mehauffey's recommendations—based on a belief that the atomic bomb has made the present canal militarily obsolete—are expected to incorporate three points: Immediate completion of the third locks project, immediate modernization work on the present system and immediate study of the possibility of building a sea-level canal.

dice.

NYT 10/13 PROBLEM OF THE BOMB

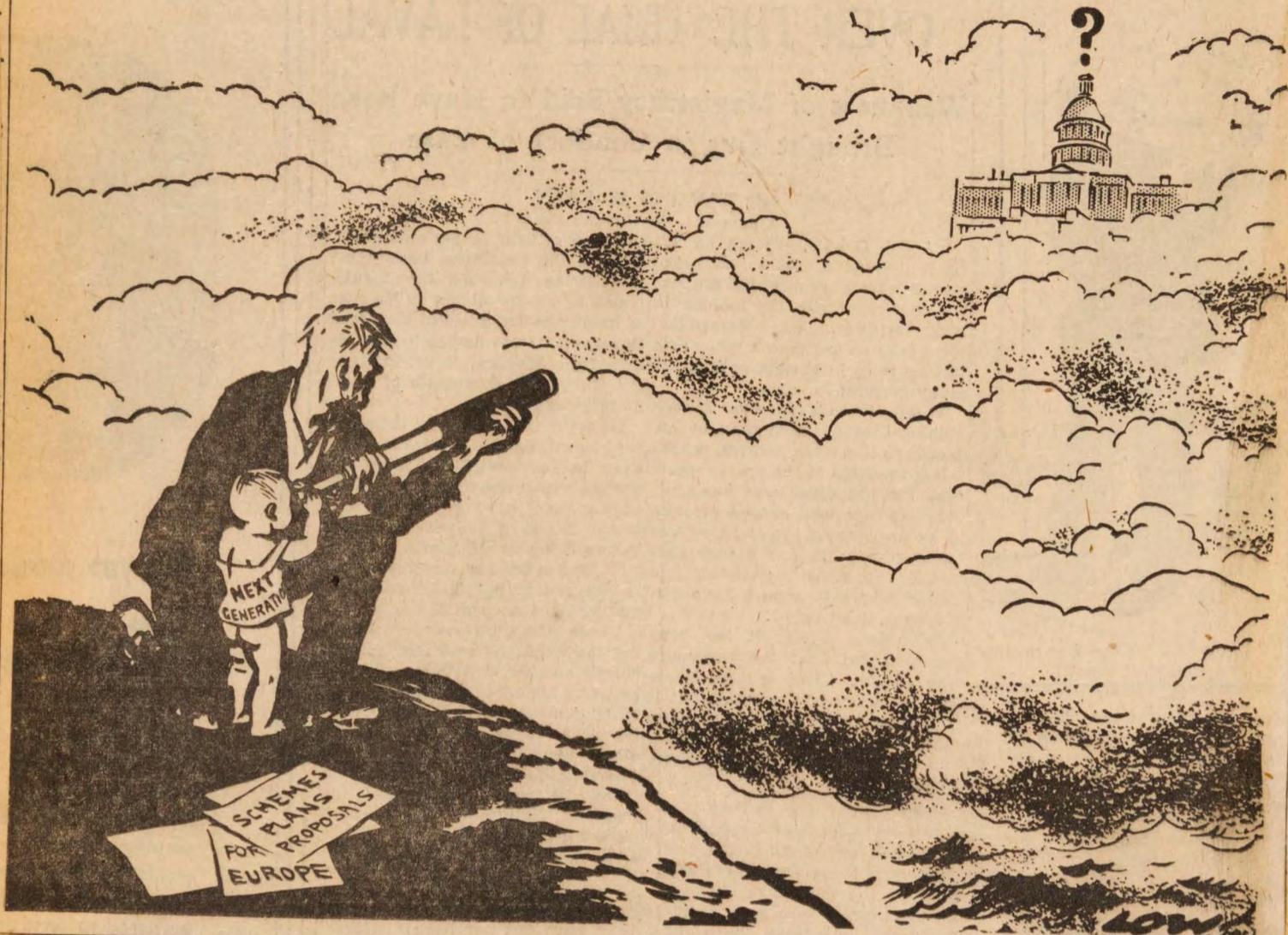
The hearings of the House Committee on Military Affairs and the statements that have come from the physicists at Oak Ridge and Los Alamos leave no doubt that we cannot hope to maintain our leadership in the production of atomic bombs longer than five years. Only the technical design of the bomb is still wrapped in secrecy, and we may be sure that, now that the methods of concentrating uranium-235 or converting uranium-238 into plutonium are well known, nations with industrial resources less impressive than our own will also have atomic bombs. The scientists see no sense in trying to produce more and bigger bombs than other countries. To engage in a bomb-improving and bomb-producing race is merely to pursue the futile policy of the past. Despite the hint from the Navy that there may be a defense against atomic bombs, both

the Los Alamos and Oak Ridge groups see nothing specific in sight except counter-offensive or "preventive" warfare.

Such is the potency of the atomic bomb that the glimpse which General Marshall gave us in his annual report of a future war waged with improvements on standard weapons seems to have made little impression. Terrific as the atomic bomb is, we cannot gloss over General Marshall's single bombs which are filled with high explosive of the familiar type, which weigh 45,000 pounds and which are already in production; or a promised bomb which is to weigh 100,000 pounds; or planes which will carry such loads "to attack any spot on the earth and return to a friendly base." What is the difference between killing 100,000 civilians at a single blow with an atomic bomb or at several blows with a few 100,000-pound bombs?

The Oak Ridge and Los Alamos scientists see hope only in American cooperation with the rest of the world in controlling atomic energy as a weapon by a world authority. Both groups concede that such an authority can be effective only if cooperating nations make some concessions in sovereign rights. The proposal is a logical one. It deserves support. But in the long run, whether we are swayed either by General Marshall's report on the character of the standard weapons that are already in development or by the power of the atomic bomb, it is the abolition of war itself that must be the chief aim.

"LOOKING TOWARD WASHINGTON"



Low © All Countries

Maybe You Wouldn't Like Atom Plan's Alternative

By Lowell Mellett

NYP
10/16 The most statesmanlike approach to the problem of what to do about our atomic bomb has been offered the country by 400 scientists who participated in its development.

Summarized, they say:
The scientific basis of atomic power is known throughout the world;

Other countries can achieve the technical designs and industrial methods, now the secret of the U. S., Great Britain and Canada:

In a few years it may be possible, here or elsewhere, to manufacture bombs ten, a hundred or a thousand times more powerful than those we dropped on Japan;

Counter-measures against the ways in which such bombs could be used would be difficult and uncertain;

Having the most and the biggest of the bombs would not be decisive; "The overwhelming advantage will lie with the aggressor and our superiority might be lost in the first minutes of a surprise attack";

We cannot prevent other countries from producing atomic bombs by holding over them our present advantage as a threat;

"We must co-operate with the rest of the world in the future development of atomic power, and the use of atomic energy as a weapon must be controlled by a world authority."

The full statement of the 400 scientists appeared in the Sunday papers. The summary is given here for the benefit of those who, in the excitement of the burgeoning football season, missed what the scientists had to say. And also in order to measure their proposal alongside a possible alternative.

Shall We Begin to Dig?

Others have suggested alternatives. For example, there is the suggestion that the American people start preparing now to live underground, in abandoned coal

mines and tunnels. Another is that we rely on the old military maxim that for every offensive weapon sooner or later a defensive weapon is produced.

Apart from the answer given to that by the scientists, the second doesn't offer much comfort. For, if we should start out in a high-minded mood to obliterate an enemy with our atom bombs, it would be very discouraging to discover that the enemy had developed an adequate defense.

No, we need something more effective. It is to be found in another military maxim, which is that the best defense is the offense, or, as the scientists themselves put it, "the advantage lies with the aggressor." So, it's simple. Let's be the aggressors!

The Trick Is Simple

We've got the thing that will do the business. We've got the secret of how to make 'em and the machinery to make 'em with and the money to pay the bill. Before anybody else catches up with us, we could start using our advantage.

It is a simple trick when you examine it. We only have to do what Germany did and what Japan did: Start a war and declare it afterward. Declare it after we have wiped out their cities and all the people in them.

This plan unquestionably will work, but, on account of this being a democracy, it contains certain difficulties. In a democracy the people make national policy and so all the people would have to be let in on the secret.

The people would have to decide first which country was our enemy, whether it was Mexico, or Argentina, or Russia, or What.

It couldn't be Britain or Canada, because they've got the secret too. But we could find an enemy. Hearst, Patterson and McCormick would be glad to help us.

Then we'd need only the brief training period required to perfect our whole population in the art of deception, for some of us may not be natural liars. That is important, because it would be necessary to keep the enemy we'd picked out convinced that we had only the friendliest feeling in the world, that we couldn't possibly conceive of war with him. Then, when we had all his suspicions allayed—whoosh! No more Mexico City, or Buenos Aires, or Moscow, as the case might be.

There it is, the one effective alternative to the proposal of the 400 scientists. Take it or leave it.

Secrecy and Censorship Seen as Fatal to Progress in Atomic Research

NYT

By WALDEMAR KAEMPFERT

10/14

The problem presented by atomic energy perplexes both Congress and scientists. At hearings conducted last week by the House Committee on Military Affairs Maj. Gen. L. R. Groves, an advocate of secrecy, testified that it would take anywhere from five to twenty years before the most powerful nations would catch up with us, and this because of the enormous industrial effort that would be required. Dr. Harlow Shapley saw little logic in secrecy because physicists abroad know as much about atomic energy as we do. A group of University of Chicago scientists publicly announced that the official report on the bomb revealed "a wealth of technical data on making the bomb" and warned against passing any legislation until a Congressional committee had been given all the pertinent facts in open and closed sessions.

In Chicago Dr. Arthur H. Compton, who had much to do with the development of the bomb, declared, "It is well recognized by both the military and the scientists that we have nothing to hold back that will appreciably affect the rate of progress of a determined rival in building atomic bombs" and that "it would be a tragic error to suppose that by keeping this 'know-how' to ourselves we can appreciably delay the progress of a determined rival."

Nobody mentions Soviet Russia, the power most likely to develop a bomb of its own within the next five or ten years. Neither we nor the Russians were eager to exchange military information during the war. The Russians were not invited to participate in the development of the bomb, nor is there the slightest intention of telling them how our bomb is constructed. This is not likely to hold the Russians back. They have deposits of uranium ore, and they have both the physicists and the industrial resources to develop a bomb of their own.

As matters stand, the scientists' avowal that secrecy is impossible seems to have made no impression. A dozen bills have been introduced which would not only maintain secrecy but control research in atomic energy for any purpose, establish a censorship on the publication of new information about atomic energy and make it a criminal offense to engage in nuclear research or to publish new discoveries without official permission. One bill even prescribes the death penalty.

Far-Reaching Powers

All of these bills have been tabled except the May bill framed by the House Committee on Military Affairs. This one would requisition ore deposits in this country and any property deemed necessary in conducting research in nuclear physics and inflict fines up to \$100,000 or ten years in jail for willful disclosure of information or violation of other official regulations. An Atomic Energy Commission is to be established which would have these powers, the most far-reaching ever given to a Government agency.

When he was pressed during the May committee's hearings to be specific in his warnings of the danger inherent in atomic experimentation, Dr. Vannevar Bush replied, "Some fellow making uncontrolled experiments in some attic might set off enough radioactive energy to sterilize every person who passed by." If this is so, and we doubt it, Major General Groves and those like him who believe that only a nation with our vast industrial resources and technical skill can deal with atomic energy for years to come, must be wrong.

The physicists who testified in Washington and expressed themselves elsewhere, have been singularly blind to the traditions of science. All admit that there is no way of stopping an adequately equipped industrial nation from developing its own bomb, yet, in the face of this they seem willing enough to permit some Atomic Energy Commission to own all domestic uranium supplies, control the export and import of uranium, decide who shall or shall not conduct research, even for medical and industrial purposes, and to fine and

imprison any unlicensed scientist who may conduct research in nuclear physics or publish his findings without permission.

It seems to have been forgotten that science thrives by the free exchange of knowledge and that nothing would be so fatal to its progress as secrecy and censorship. Since there is no real secret about splitting the uranium atom, this department fails to see the need of any domestic legislation of the kind proposed.

International Control

Most important is the international control of atomic energy. This seems dubious, especially in view of Soviet Russia's policy. At present atomic energy can be released only from uranium by a roundabout process. Suppose that an agreement were reached which would give some international authority the right to inspect plants that utilize uranium and to report periodically on what it finds. How would it be possible to stop a nation which is obviously engaged in developing a bomb unless the international authority were backed by a police force? Or suppose that Russia refuses to make any international agreement. The United Nations would be helpless. The whole doctrine of sovereign rights is involved.

Both in this country and abroad it has been suggested that the atomic bomb be outlawed by international agreement. Will this do any good? Germany, among other nations, signed a Hague Convention which forbade the use of gas in war, but did not hesitate to violate it in World War I. There were pacts enough after 1919 to avoid war. All proved to be futile.

Dr. A. H. Compton in his Chicago address said that "if we are wise we shall take immediate steps to form a world government by international agreement instead of waiting for a third world war of unparalleled destructiveness to determine the rulers of the world." World government is probably utopian at present, but instead of attempting the hopeless and even ludicrous task of trying to keep a secret which is no secret at all, we ought at least to be thinking of disarmament and the abolition of war.

There is no sign of disarmament. Instead, we talk of preparedness for a third world war and of trying to control the use of atomic energy as if that were likely to avert disaster. And worse still, science faces a drastic restriction of free research and free speech.

RUSSIANS BELIEVED NEAR ATOM SECRET

Frenchman and Japanese Hold Soviet Has or Will Soon Have Bomb Knowledge

NYT 10/15

PARIS, Oct. 14 (Reuter)—German scientists "who were on the eve of successfully completing their researches on the atom bomb" were captured by Russians on the Danish island of Bornholm and taken off to Russia, Paul Rivet, French scientist, stated here tonight. The Russians will have the secret of the atom bomb in six months, he asserted.

With the scientists the Russians had captured their notes and all their equipment, Professor Rivet declared.

Professor Rivet added that already scientists were ready to produce a new type of atom bomb sixty times more powerful than that used against Japan. Four of the new type of bombs would be sufficient to destroy the whole of Paris, he said.

Japanese Believes Russia Has It

SAN FRANCISCO, Oct. 14 (UP)

—One of Japan's foremost physicists believes Russia probably already has perfected an atomic bomb as good as or better than those developed by the United States, Larry Tighe of the American Broadcasting Company said today in a broadcast from Tokyo.

Prof. Bunsaku Arakatsu, head of the nuclear physics department at the Imperial University at Kyoto, told Mr. Tighe that Japan could perfect an atomic bomb of her own within five to ten years and that he had already made tremendous strides in that direction when United States military forces cut off the electric power in his laboratory.

The Japanese scientist laughed when told the United States did not intend to permit the secret to fall into other hands, asserting that any country which could afford production costs could be manufacturing atomic bombs very soon, Mr. Tighe said.

He reported that he and Keith Wheeler of The Chicago Times saw Arakatsu's laboratory and that they were "shocked speechless" at the progress Japan already had made. Much of that progress had been made, Arakatsu said, since the first bomb was dropped at Hiroshima. The information he gained from studying the Hiroshima area cut his own research by at least forty years, the Japanese scientist said.

"Arakatsu dumped the biggest bombshell our way when he told of his studies at Cambridge in England eighteen years ago," Mr. Tighe said. "He studied with a Professor Kapitza of Russia, who was working on nuclear theories at that time."

"Since then Professor Kapitza has become the foremost Russian scientist in atom research, and a few years ago developed a method of liquifying hydrogen and helium."

"Arakatsu believes—and managed with almost no effort to convince us—that Russia at least is very close to the core of the atomic-bomb problem."

Hutchins Sees No Defense

CHICAGO, Oct. 14 (UP)—Dr. Robert M. Hutchins, Chancellor of the University of Chicago, said today that there would be no defense against atomic bombs in the next war because foreign agents would plant them in advance in strategic locations for detonation when hostilities begin.

"There is no defense against the atomic bomb," Dr. Hutchins told nearly 2,000 persons attending services in the university's Rockefeller Memorial Chapel. "There is no method of detecting storehouses of bombs or factories which are making them. There is a defense against the carrier, if it is an airplane; but a carrier, in the ordinary sense, is not needed for atomic bombs."

"Missiles can now be guided to their target by radio, and rockets can be fired from airplanes which are beyond the range of modern defensive instruments."

"But the cheapest and surest way of blowing up an enemy's cities is to send agents into them in peacetime to plant bombs in strategic locations which can be detonated when war is decided on."

"The conventional reliances of the past—a large army, navy and air force—are obsolete. They find favor only in the nostalgic dreams of obsolescent generals and admirals."

"The war will be won by atomic bombs planted by agents or sent in by rockets, and victory will go to the country which lands the most destructive bombs first."

Mr. Hutchins renewed his appeal for disclosure of the "so-called secret of the atomic bomb," the weapon that scientists at the University of Chicago helped to create.

PATTERSON, BUSH BACK SCIENCE AID

Tell Senate Group Government
Must Aid Research—Expert
Dubious of Atom Defense

By WINIFRED MALLON

Special to THE NEW YORK TIMES.
WASHINGTON, Oct. 15 — Federal support of scientific research was urged today by Robert P. Patterson, Secretary of War, and Dr. Vannevar Bush, Director of the Office of Research and Development, not only as an essential measure of national defense but also as a major factor in the achievement of international agreements designed to assure world peace and security for all peoples.

Both testified before the joint Senate committee that is holding hearings on bills providing for the creation of a national research foundation.

In reply to Senator J. William Fulbright, Democrat, of Arkansas, who contended that in view of the paralyzing effect of an initial attack with atomic bombs, it would be more effective to concentrate on methods to prevent war than on the development of counter-acting defense mechanisms, both Mr. Patterson and Dr. Bush insisted that neither approach to a solution of the problem need be or should be abandoned in favor of the other.

Conceding that no specific way or no "trick method" of defending against atomic bombs now is in sight, Dr. Bush argued that anti-aircraft devices now in use or, he hinted, in process of development would apply equally to planes dropping atom bombs. Such defense measures, he added, were subjects of constant study and research activities.

"The atomic bomb differs in magnitude but not in kind," Dr. Bush said. "The only difference is it is vastly more powerful, requiring new and correspondingly powerful defensive controls."

Both witnesses approved the proposed Federal aid plan in the interest of maintenance of present American leadership in scientific research and development, upon which, they argued, would largely depend the degree and extent of the influence of the United States in the negotiation of any international arrangements for the prevention of future wars.

"Weakness on the part of those who love peace invites war," Secretary Patterson told the committee.

The Magnuson bill, providing for control of the proposed foundation by a board of nine members empowered to elect a director to carry out programs or projects approved by them, rather than by a director to whom the members of the board would have only an advisory relationship, was endorsed by both witnesses.

Both advocated also the exclusion from the legislation of the patent sections of the Kilgore bill, a modified version of which is in-

Navy to Answer Inquiries For Ships in Celebration

A Navy information center, Third District Headquarters announced yesterday, will give twenty-four-hour service to persons anxious for news about vessels that will participate in the Navy Day celebration here.

Rear Admiral Monroe Kelly, Third Naval District Commandant, said the service would have information on arrival, berthing, departure dates for all ships putting into New York. It will have more meagre detail on other ships east of the Mississippi, and, later, on ships entering Pacific ports.

When the fleet is in, the information center will put through emergency calls, family or routine calls, not of emergency nature, will not be put through. The center's telephone is HANover 2-1500.

cluded in the joint Kilgore-Magnuson redraft now under consideration.

MAY RENEW ATOM HEARING House Group Wavers Despite Truman Plea for Speed

By WILLIAM S. WHITE

Special to THE NEW YORK TIMES.
WASHINGTON, Oct. 15 — In spite of a new, urgent suggestion from President Truman that Congress proceed with all speed to pass the Administration's bill for nationalizing atomic energy and the atomic bomb, the House Military Affairs Committee seemed to be leaning tonight toward a decision to reopen hearings on the measure.

Mr. Truman, it was learned on competent authority, sent informally and privately to the Capitol during the day "by the grapevine," as one Congressional informant put it, a strong expression of hope that the committee would stand by its previously announced plan to report the bill out on Wednesday. Opposition to this course, however, had been rising over the week-end, capped last night by that of the Congress of Industrial Organizations, and the committee chairman, Representative Andrew J. May, Democrat, of Kentucky, somewhat softened today his previous position against a resumed hearing.

Mr. May, who on Saturday had said that "no further hearings will be held," said today in response to inquiries that he would not insistently hold out against the acceptance of further testimony and added that perhaps it would be as well to hear additional witnesses.

The committee, which had been summoned to meet tomorrow in what had been intended as a routine session, will probably take a final decision at that time. Inquiry among the Republican members disclosed what one of them, Representative Paul W. Shafer of Michigan, asserted as a "pretty fair certainty" that the Republican side would vote solidly for more hearings.

As for the Democrats, at least two members, Representatives John J. Sparkman of Alabama and Chet Holifield of California, had been working along for such a resumption.

The demand for additional hearings to supplement the five-hour public discussion with which the

committee had concluded that phase of its consideration last week had arisen in four quarters. A number of scientists associated with the development of the atomic bomb had protested that they had not been heard. Then, yesterday, Philip Murray, president of the CIO, sent to Speaker Sam Rayburn a telegram accusing the leaders of trying to "railroad" the legislation and asserting that President Truman should cause the Democratic leadership "to arrange adequate public hearings."

Truman Promotes Gen. Groves

WASHINGTON, Oct. 15 (AP)—Maj. Gen. Leslie R. Groves, who commanded the Manhattan Project which developed the atomic bomb, was nominated by President Truman today to be assistant to the army Chief of Engineers, succeeding Brig. Gen. John J. Kingman. General Groves also would be promoted to the permanent rank of brigadier general. His present rank is temporary.

Senators Told Atomic Bomb Defies Defense

Patterson and Bush Testify
to Its Power; Groves Gets
Army Engineers Post

WASHINGTON, Oct. 15 (AP).—Science and the Army teamed up today to tell Congress there is no defense against the atomic bomb except the defenses that work on other sorts of bombing.

At the same time, President Truman nominated Major General Leslie B. Groves, over-all director in the development of the new weapon, to be assistant to the Army chief of engineers.

That shift was taken to show the emphasis the Army proposes to put on nuclear energy weapons. He would succeed Brigadier General John J. Kingman.

General Groves also was named for promotion to brigadier general on a permanent basis. His present rank as major general is temporary.

The testimony on lack of any special defense against atomic bombs came from Secretary of War Robert P. Patterson and Dr. Vannevar Bush, head of the Office of Scientific Research and Development. Both testified before a joint military-commerce sub-committee of the Senate which is considering legislation to set up a national scientific foundation. Mr. Patterson said there is no known defense "peculiarly effective against the atomic bomb."

Said the scientist who worked on its development: "There is, in my opinion, no trick way of getting rid of the atomic bomb—because it is an atomic bomb."

Defense Was Reported

Their testimony differed from a recent report of the House Naval Affairs Committee which said there were "indications that an effective counter measure to atomic bombs has been developed to such an extent that they can be exploded far short of their objectives."

In the midst of the disagreement the House Military Affairs Committee indicated that it may change its mind and reopen hearings on atomic energy. These had been closed after one day of testimony.

Representative Carl Vinson, Democrat, of Georgia, chairman of the House naval group, issued a statement saying the Navy was not the source of the report on a possible atom bomb defense.

He said there was (a) the Crosby Research Foundation report that the bombs could be exploded by a certain device when they were miles away, and (b) a British newspaper announcement that the United Kingdom had developed "an effective counter-measure" through use of a proximity fuse.

Doubts Atom-Bomb Defense



Associated Press wirephoto
Dr. Vannevar Bush, director of the Office of Scientific Research and Development, testifying before a Senate committee

Cites Arnold Opinion

Moreover, Representative Vinson declared, General of the Army H. H. Arnold, chief of the Air Forces, called a defense against the bomb almost an "inevitability."

It was reliably reported that Navy chiefs had urged Representative Vinson to take them out of the picture presented in last week's report.

Meanwhile, Representative Andrew J. May, Democrat, of Kentucky, chairman of the House Military Committee, indicated that perhaps more testimony from scientists would be desirable. He said he would ask the committee tomorrow if it wishes to reopen hearings, which had been closed, Representative May said, for lack of additional witnesses.

"A lot of people think we should hear some scientists," Representative May said today. A group of Chicago scientists had asked to be heard.

"If the city can defend itself against any kind of bombing, it can defend itself against the atomic bomb," Dr. Bush told the committee, but no city in this war—in an active war area—has been completely safe from bombing.

Venezuela Guards Its Minerals

CARACAS, Venezuela, Oct. 15 (UP)—Deposits of radio-active minerals were declared a national reserve by a decree of President Isaias Medina, published today. Exploration and exploitation can be carried out only by the Federal Government, the decree provided.

The atomic bomb as a problem for the future is exciting and ominous enough. But the atomic bomb as a factor in contemporary international politics, if less exciting, is perhaps even more ominous. Probably no one thing has contributed more, directly and indirectly, to the deterioration of international relations than the existence of this horrible weapon and the crassly maladroit way in which this country has dealt with it. Probably the most unfortunate single utterance by any chief of state since the war's ending was President Truman's unbelievably inept declaration that the secrets of the bomb would be given to nobody, since no other nation possessed the industrial resources and techniques to make use of them anyway. The very fact that this declaration has elicited no reaction from abroad, that it has fallen instead into an icy well of grim silence, is some hint as to just how unfortunate the statement was.

It was a nakedly nationalistic declaration tending to destroy most of our protestations of interest in an internationally organized world. It is useless for us to draw up nicely international solutions for problems—like those of the Italian colonies or the Dardanelles—of immediate or vital interest to others if we show no faith in internationalization when it comes to a matter in which we have to take some risk.

Its emphasis on our supposedly superior technical and industrial resources could only inspire fear without any corresponding awe. It was bound to depress the British, already struggling against a dangerously pessimistic view of their own place in the future. It was bound to deepen the chasm between the West and Russia, to intensify the bumptious Russian fears and to force the Russians to solve the technical secrets of the bomb, since that is their only defense against the general industrial superiority of which we boast. Immediately after the entry into Germany the Americans are said to have tried to round up all the German atomic experts, partly to keep them out of the Russians' hands. It is not surprising that the Russians are now reported to be rounding up all whom they can find as well as intensifying their acquisition of uranium ores, and it will be surprising if Russia does not have her stock of atomic bombs within a fairly near future.

That in itself may or may not matter. What does matter is the poison meanwhile being instilled into the whole international system by this blundering treatment of a factor of such overwhelming consequence. The very terror which it has imparted to the idea of another great war is forcing a frenzy of nationalistic claim and counter-claim now, when every one knows that they are safe both from a great war and from the actual use of atomic bombs for some years at least to come, and that claims which are to be made good must be made good at once. The bomb, which might have been used as a wedge opening the way to a more rational control of all armaments, is today casting a vaguely sinister shadow of war and armament over every aspect of international affairs, inspiring an exaggerated fear abroad and exaggerated sense of careless power here. It is already late to reverse the course and bring a more penetrating statesmanship to the handling of this question. One can only hope it is not too late.



I'd Rather Be Right

By Samuel Grafton

NOTES ON THE ATOMIC BOMB: 1. There is evidence that we Americans are beginning to delude ourselves about the nature of the atomic bomb, perhaps because the reality is too painful to bear.

One hears it said that it ought to be possible to outlaw the use of the atomic bomb in war, much as we outlawed the use of poison gas in the last war, by international agreement and by fear of retaliation. But the analogy with poison gas is probably worthless, mainly for the reason that poison gas is an indecisive weapon of war, whereas the atomic bomb is a decisive weapon. If it is used properly, or improperly, there is not enough of the enemy left to retaliate.

In the case of poison gas, propagandist and other considerations made it worthwhile to wait and let the enemy use the weapon first, if he dared; in the case of the atomic bomb these considerations are reversed, and every military circumstance dictates the earliest possible use of the dreadful missile. What general staff would wait and let the other side use the atomic bomb first, so that it could issue a press release calling him a low fellow?

Ideas of the Past

2. We are also beginning to delude ourselves by talking about "defenses" against the atomic bomb; and we drag out the comforting old chestnut about how the science of war proves there is a defense to every weapon of offense. Some of this is Navy talk; but even our magnificent Navy would be hard put to it to defend us against a bomb left in a hotel room or a station locker; and traffic conditions in our big cities are such that battleships cannot deploy easily up and down our streets.

And any defense against the atomic bomb must be 100 per cent effective to be at all effective; it must stop every bomb, or it is a failure; yet there are almost no defensive instruments or techniques known to military science which do not allow the enemy to get at least a portion of his striking power through. A defensive screen which would stop 90 per cent of atomic bombs aimed our way would be little better than no defense at all. We tend, almost unconsciously, to minimize the power of the atomic bomb in our thinking, so that we can handle it more comfortably, with ideas drawn from the past: we're afraid to see it as big as it is.

We're Backing Into Fantasy

3. We are, therefore, retreating into dangerous fantasies, including the fantasy that nations will hesitate to use the new weapon; a ridiculous belief on the part of citizens of a country which has already used it. Every circumstance indicates that the bomb cannot be handled by a commission under our government, but only by a world organization greater than our government, or any government, but we retreat from looking squarely at this conclusion, as we retreat from looking squarely at the bomb itself.

Both are too big for us, and we take to day-dreams instead, including the day-dream that we can make an American citizen of the bomb, and keep as an exclusively American asset a weapon devised on the basis of the work of a former German scientist named Einstein, an Italian named Fermi, a Dane named Bohr, an Austrian named Schroedinger, as well as various distinguished Americans, Englishmen, and New Zealanders.

After the Horror, Smugness

4. It is quite clear that those who seek to reassure us are not helping us; our great problem is that we are not scared enough; after the first horror there has come smugness and a flight from reality. We cannot afford to see the truth, and still retain our rather primitive political ideas about the organization of the world, and so we turn our heads away. It may be an epitaph on an age that as between an organized world, and the split and angry atom, we have decided that, on the whole, the former is the greater peril, the one to fear.

PN 10/16
The day after President Truman announced the discovery of atomic energy and the atom bomb, Henry Wallace was asked what he thought about it.

"There are now two terms," he answered, "in which all of us have got to get used to thinking:

¶ "World peace."

¶ "Abundance."

I think it would be hard to sum up the impact of the atom bomb more concisely or more accurately. Abroad and at home—those are the terms in which we have got to keep thinking. Nothing less will do before the staggering potentialities which face us.

And yet day after day, here in Washington, military men, who already are thinking about the next war in terms of the one we have just finished; industrial-scientists who are terrified at the implications of atomic energy for our whole scarcity economic system; legislators, who are groping through a fog of sheer befuddlement—are trying to cut the atom down to size. Their size.

They just can't do it.

But in the process of trying to keep it within the measure of their own interests and their own purposes, they are opening the way to disaster in our relations with the rest of the world and to industrial monopoly, if we don't watch out, in the future use of atomic energy.

Picture of Its Potentialities

Yesterday, for the first time, some of the scientists who actually worked on the atom bomb, gave us a picture of its potentialities, its dangers and its magnificent opportunities—a picture that was startlingly clear after much of the fuddy-duddy, musty talk that we have been getting for the last 10 days.

Here it is almost three months that we have been plunged into the atomic era, whose terrible urgency demands the utmost in American thinking—not in little, unimaginative terms, but in big terms. For a few brief weeks when the crashing impact of the news fell upon us, there was a sense of this terrible urgency a whole quickening of the national thinking. Yet already this has slipped away so that you would hardly know by the news from Washington that we have got to face the reality of a new world.

To read Gen. Marshall's report on the last two years of the war, you would scarcely believe that he has been jolted out of traditional Army thinking by the atom bomb. He mentions it, of course, and its terrible potentialities. Yet he can say such things as this:

"So far as they can see world conditions a decade from now, War Dept. planners, who have taken every conceivable factor into consideration, believe that our position will be sound if we set up machinery which will permit the mobilization of an army of 4,000,000 men within a period of one year following any international crisis resulting in a national emergency for the United States."

How, in the face of the atom bomb and what our scientists already have told us of it, anybody can complacently count on a year's time in which to get ready is beyond understanding.

The truth is that traditional Army thinking simply is inadequate to the realities of atomic energy and the solutions that must be found on an international level if nations are to avoid blasting one another into oblivion.

Traditional Navy Thinking

The same thing is true of the Navy. Bigger and better battleships, more and more ships, more and more island bases—traditional Navy thinking in the face of the immensity of the atom bomb.

Nobody can want the Army and Navy to pack up and call it quits because of the new era into which we are advancing dizzily. But these men talk as though they wanted to pretend that the terrible discovery had not been made and that by talking in terms of the familiar—only bigger and better—somehow they could exercise what already has happened.

They can't exercise it. It has happened. And the scientists have told us over and over again that it can neither be stopped nor kept secret. That there is no secrecy left in it that can last longer than a few brief tomorrows.

Wallace talked of world peace and abundance in that order. Actually we have been trying to reverse the order. What the last week's hearings have been about, both on the May-Johnson bill in the House on atomic energy and the Kilgore Committee in the Senate on more general scientific legislation, has been on the domestic implications on atomic energy.

Yet inevitably the testimony has slipped quickly from the briefest of domestic thinking into the infinitely more pressing field of international relations. The stark fact has emerged that we simply cannot talk or even think about the domestic use of atomic energy until the essential problem of its adjustment into international life has been settled. The civilized life of this planet as between nation

and nation has got to be assured first before you can think logically of making our railroads run with a few pinches of uranium.

Yet even in the domestic field we have had testimony showing clearly the fear of industrial scientists that atomic energy may get out of the hands of the great industrial corporations and into the hands of the Nation as a whole, that the social use of atomic energy will eventually destroy the tight power monopolies of today.

The Anxiety of the Scientists

On the next page is a report of the testimony of some of the scientists who played vital roles in development of the atom bomb. Their testimony was invited by the Senate Kilgore Committee. They will appear, too, before the House Military Affairs Committee, considering the Johnson-May bill, which had not originally planned to call them. It was their own anxiety over the secrecy—not military, but political—surrounding the atom bomb that led them to demand to be heard. It is essential that the American people hear them through.

Two principles are clear if we are to achieve the world peace and abundance of which Wallace spoke:

¶ As a weapon, the atom bomb must be controlled by a world state with sovereignty to do the job.

¶ As a source of energy, atomic fission must be so socialized that it frees men rather than enslaves them.

More Hearings Likely on Atom Bill Despite President's Plea for Speed

Move Gains In House Group to Call Bomb Scientists

By ELIZABETH DONAHUE
Washington Bureau

WASHINGTON, Oct. 16.—The voice of the underground scientists who demand a full hearing on the revolutionary atomic bill appeared today to have pierced the ears of the House Military Affairs Committee, which is expected to reopen hearings today in direct contravention of a secret request from President Truman.

The House group, besieged with petitions from the foremost atomic scientists in the country, who fear military dictatorship and an Army move to lock up the open "secret" of the bomb and enslave the scientists who made it, will not concur with the President's request for immediate passage of the legislation.

Climaxing the terrific drive by the Army to jam the bill through before its far-reaching provisions have been subjected to more than cursory scrutiny, the President yesterday sent word to Democratic members of the committee that the measure should be enacted with all possible speed.

Two members of the committee who normally support Truman, Rep. Chet Holifield (D., Cal.), and Rep. John Sparkman (D., Ala.), are not in accord with his views on the matter.

Sparkman Sees Danger

Sparkman, who over the week end discussed the bill with Dr. Leo Szilard, who is rated as the second most important scientist who worked on the atomic bomb project, has come to two conclusions:

¶ That the bill would, under the



Rep. Holifield



Rep. Sparkman

all-powerful nine-man commission it proposes, constitute a "military dictatorship" over science.

¶ That the commission, which the Army and industrial scientists representing big corporations seek to control, would be guided exclusively by dollar-a-year men (the bill clearly states that the commission work would be a part-time job) and would have dictatorial power to grant all licenses and suppress atomic research where and when it saw fit. Sparkman will propose an amendment to eliminate dollar-a-year men from the commission.

Holifield and Sparkman will both vote today with the Republicans to reopen the hearings, which Chairman Andrew J. May closed down after only five hours of testimony, during which only four witnesses were heard.

Bush Talks Again

One of the witnesses was Director Vannevar Bush of the Office of Research and Development. Bush, who controlled all the Government research contracts during the war, is also president of the Carnegie Institute and an electrical engineer.



Dr. Bush

He has contended throughout that the atomic bomb bill is purely a domestic control measure. But scientists more familiar with the bomb and the possibilities of atomic energy contend that the secret is already well known abroad. They say the U. S. A. has a slim lead on the engineering "know-how" and that the stringent domestic controls set forth in the bill are both futile and tend to foster international bad will.

The suspicion that the Army is mainly concerned with building a big stock of bombs before any international agreements are concluded was clearly demonstrated in Bush's statement to the Kilgore Subcommittee of the Senate yesterday.

He declared: "We will have to have political arrangements, but when we do, we must approach them with our full strength."

This, according to informed spokesmen in Congress, is the Army's argument. But it is the contention of the scientists and those familiar with our atomic potentials

that England, Russia, and other countries can have a smaller stock of bombs in a comparatively short time and that even a few bombs, as has already been shown, can virtually destroy a nation. The answer, this group asserts, is the immediate undertaking of international agreements to control and inspect the development and use of atomic energy.

The bill which Bush discussed yesterday contains many of the organizational features of the atomic bomb bill, although it was designed to provide Federal aid for private and public scientific research, not necessarily atomic research. It was drawn with the help of Bush and the Army. It also sets up a nine-man commission similar to the one provided in the May-Johnson atomic bomb bill.

Sen. Harley Kilgore (D., W. Va.) is battling to alter the research measure so that a director, appointed by the President, would have final authority and the commission would be relegated to an advisory position. It is expected that President Truman will today uphold Kilgore's position that a director should have final authority over the commission.

Bush in his testimony presented a thinly disguised argument for the big business monopolists who are fighting Kilgore's attempt to write some free patent provision into the research foundation measure.

Echoing spokesmen for General Electric and General Motors who have testified, Bush opposed any provision throwing open the results of all Government-financed research to the public.

Forecasting, as others have done, a sit-down strike by big industries if they are compelled to abandon their monopolistic advantages and their control of the use of patents, Bush said:

"It" [the Kilgore patent clause] "would, for example, deny to the Government, the services of many of the most competent industrial organizations in the country . . . if all rights to the inventions created by time, skill, equipment, and investment are to be forfeited."

Meanwhile, the mysterious assertion in a House Naval Committee report that the Navy had evolved some defense against the atomic bomb was watered down in an additional statement by Committee Chairman Vinson (D., Ga.).

"I am not a scientist, but I have complete confidence in the ability of our scientists and in American ingenuity to cope with new challenges," Vinson said. "Of course, the real defense to the atomic bomb is a working peace."



Sen. Kilgore

Britons Warn on Atomic Secrecy; Peer Sees End of 'Peace by Force'

By Wireless to THE NEW YORK TIMES.

LONDON, Oct. 16—The ideas that the atomic bomb could be the monopoly of any one country or that its manufacture was a secret, the formula of which could be destroyed were described as "impracticable" and "foolish" by the Earl of Darnley in the House of Lords today. During debate that he initiated, Lord Darnley asked the Government to urge the United Nations, in view of the potentialities of atomic energy, to abandon methods of "peace by force" and "provocative peace treaties."

Speaking for the Government, Lord Addison, leader of the House of Lords, said:

"To think we can control the use of this indescribable force by adopting the method of secrecy is to bury our heads in the sands. It all depends on our minds and dispositions; by no apparatus of secrecy will humanity be able to safeguard itself against this peril."

Lord Darnley asserted that the common man did not have much confidence in the Security Council of the United Nations Organization, which, he said, was charged with priorities and favoritism based on force rather than needs.

Lord Addison in reply said he was impressed by the widespread mistrust of international cooperation, but he believed the nations could gradually begin to trust one another better and be less likely to devote their energies to manufacturing machines of destruction.

"I believe the world is only just at the beginning of international cooperation," Lord Addison said. "We shall make many mistakes, but we cannot afford to fail."

Lord Cherwell, who was scientific adviser to Prime Minister Churchill during the war, deprecated "loose talk" about the idea that the atomic bomb could explode the world and exaggerations about the future of atomic energy.

[The United Press quoted Lord Cherwell as saying, "There is no fear of the world blowing up, but civilization as we know it may be destroyed."]

People talked as if a new era of prosperity was just around the corner because new sources of energy had been discovered, Lord Cherwell went on. It was foolish to talk about sharing the secret of the atomic bomb when the principles were known to scientists generally.

Lord Strabolgi, Labor member, interrupted to ask what, then, had President Truman meant when he said American policy was not to share the secret.

Lord Cherwell replied that President Truman had said the United

States would not divulge the "know-how" of making atomic bombs. That was a very different thing. There was no sense in talking about "sharing this secret unless one means taking the plants to other countries along with the hundreds of scientists and thousands of engineers who developed it."

For effective control of the atomic bomb by the United Nations, he added, the UNO must have some very rapid form of sanctions against a recalcitrant nation.

LONDON, Oct. 16 (U.P.)—Capt. Raymond Blackburn, Laborite member of the House of Commons, charged today that certain American interests were trying to use atomic discoveries for an industrial monopoly, and said they had rejected the suggestions of British scientists in 1943 that Anglo-American progress on the atomic bomb be made known to Russia.

"Russian scientists, in particular Kapitza and Leipinsky, were at the head of the Nuclear Physics Institute, instituted in Kharkov as long ago as 1935, and are probably working on the same lines and may even have progressed farther than ourselves," said Captain Blackburn.

[Dr. Peter Kapitza, Russian physicist, has been working, formerly at Cambridge University, England, and since 1935 in the Soviet Union, on atomic research and is credited with several discoveries in the field.]

British scientists, he added, "greatly resent" that they are not informed of what has been happening at factories in the State of Washington, where plutonium, a new element used in atomic fission, is being produced.

U. S. ATOM CONTROL IS CALLED UNIQUE

Admiral Purnell Testifies Secret Cannot Be Copied Soon— Forrestal Backs Study

Special to THE NEW YORK TIMES.

WASHINGTON, Oct. 16—Rear Admiral William R. Purnell declared before a Senate committee today that no nation other than the United States was equipped industrially to manufacture atomic bombs and he doubted that even Britain would be in a position to do so within the next five years.

Establishment of a national research foundation to continue in peacetime the close cooperation developed during the war years between military technicians and leaders in science was approved by James V. Forrestal, Secretary of the Navy, at the same hearing before the Joint Senate Committee in charge of proposals for federally-financed post-war scientific research.

Admiral Purnell said the theory but not the method of production was known to Britain, Germany and Russia, none of which nations, however, would be able for a long time to do anything about it.

Different Measures Needed

Replying to questions, he said he knew of no specific defense against atomic bomb attacks, nor did he believe in any single counter-measure, since the bombs differ and all could not be detonated by the same device, and also because "the people who make the bombs know best how to evade counter-measures."

No one now can evaluate or predict the possibilities of either manufacture or defense, he added, because "in developing this bomb we were shooting at immediate results and don't know yet what other or better methods or potentialities may reward further research."

The bombs used in Japan, he said, would not have penetrated to the underground factories of Germany "because they were not designed to penetrate."

"But they can be designed to do that," he added.

"Which reduces to absurdity all this talk of going under ground," Senator Harley M. Kilgore of West Virginia commented.

The Admiral conceded, as suggested by Senator J. W. Fulbright of Arkansas, that the atomic bomb might in the long run "wipe out the Navy, the Army and the Air Forces," but added that this was something "that remained to be seen."

Forrestal Backs Research

Mr. Forrestal left to the high-ranking naval officers by whom he was accompanied detailed discussion of the provisions of the pending legislation and confined himself to the sections of the Kilgore-Magnuson bills dealing specifically with research for military purposes. These, with the inclusion of present and proposed amendments, he endorsed as meeting in "considerable degree" military requirements in the matter of concentration and security of research activities by and for the armed forces.

"The Navy would prefer to have fundamental research on weapons and counter-measures entirely autonomous," he said, "but I believe we could operate successfully within the framework of the proposed foundation."

He asked leave, however, to reserve "final judgment" on the ground that the "effectiveness of the military segment would depend on the overall administrative control of the foundation" and the certainty that under it military research could be conducted with "complete freedom for independent action."

As qualifications for quick release from routine Army duties, Mr. Davis offered the winning essays of several finalists still in the armed services. William D. Calhoun, of Glendale, Calif., he said, suggested the possibility of the rocket as a war weapon nearly two years before the Nazis introduced it and suggested that the United States speed research on such a rocket.

Robert Folger, of Winter Haven, Fla., predicted the war and post-war uses of synthetic rubbers, and Charles P. Sargent, from Lakeville, Conn., urged utilization of heat from the earth's molten core, the harnessing of atomic power, and the turning of the sun's energy into power.

Declaration of the Dublin, N. H., Conference

Special to THE NEW YORK TIMES.

DUBLIN, N. H., Oct. 16—Following is the majority report of the Dublin Conference on World Peace:

A conference of some fifty men and women, interested in world peace and world organization, met at Dublin, N. H., from Oct. 11 to 16, 1945, to consider the question of how best to remedy the weaknesses of the United Nations Organization. The conference was called on the invitation of Hon. Owen J. Roberts, who recently resigned as Justice of the Supreme Court of the United States; Hon. Robert P. Bass, former Governor of New Hampshire; Grenville Clark, lawyer, of New York, and Thomas H. Mahony, lawyer, of Boston, and chairman of the Massachusetts Committee for World Federation. Judge Roberts presided at the conference.

Whatever may have been the efficacy of the United Nations Organization for the maintenance of international peace before Aug. 6, 1945, the events of that day tragically revealed the inadequacy of that organization thereafter so to do.

The application of atomic energy to warfare and impressive scientific evidence as to the consequences thereof have made the people of the world realize that the institution of war among nations must be abolished if civilization is to continue. The necessity of immediate action is urgent. There is not a moment to lose.

Problem of World-Wide Scope

The menace of total war is of world-wide proportions, particularly in view of the present and future international tensions. The means of preventing war, of protection against it and of control of the major weapons by which it will be waged must also be of world-wide scope if our God-given human freedom and individual liberties are to be preserved and to be promoted.

It is almost axiomatic that there can be no peace without order and no order without law. There can be no world peace until there is world order based upon principles of the limitation and the pooling of national external sovereignty by all nations for the common good of mankind. The only effective means to create such a world order is to establish a world government and to delegate to it limited but definite authority to prevent war and to preserve peace.

Such a government should be based upon a constitution under which all peoples and nations will participate upon a basis of balanced representation which will take account of natural and industrial resources and other factors as well as population. It cannot be based upon treaties establishing leagues of sovereign states in which the states retain unlimited sovereignty and act and vote as states—as in the United Nations Organization.

Since the moral law applies to nations as well as to men, and justice dictates the necessity of seeking the greatest good for the greatest number, such a world government must be a world federal government providing a minimum of centralized control in the world government and a maximum of self-government in the separate nations. This means unity of action in those things necessary to survival and freedom of action to the separate nations in all other matters.

Believing that the mounting waves of distrust and fear that

threaten mankind may engulf us in a war which, in this atomic age, would destroy civilization and possibly mankind itself; and being convinced that the United Nations Organization is wholly inadequate to prevent war, a large majority of the conference proposes:

That a world federal government be created, with closely defined and limited power adequate to prevent war and designed to restore and strengthen the freedoms that are the inalienable right of man. The specific measures proposed to attain this goal were embodied in the following resolutions:

First: That the implications of the atomic bomb are appalling; that upon the basis of evidence before this conference there is no presently known adequate defense against the bomb; and that there is no time to lose in creating effective international institutions to prevent war by exclusive control of the bomb and other major weapons.

Second: That the United Nations Charter, despite the hopes millions of people placed in it, is inadequate and behind the times as a means to promote peace and world order.

Third: that in place of the present United Nations Organization there must be substituted a world federal government with limited but definite and adequate powers to prevent war, including power to control the atomic bomb and other major weapons and to maintain world inspection and police forces.

Fourth: that a principal instrument of the world federal government must be a world legislative assembly, whose members shall be chosen on the principle of weighted representation, taking account of natural and industrial resources and other relevant factors as well as population.

Fifth: that the world federal government should have an executive body which should be responsible to the world legislative assembly.

Sixth: that the legislative assembly should be empowered to enact laws within the scope of the limited powers conferred on the world federal government, to establish adequate tribunals and to provide means to enforce the judgements of such tribunals.

Seventh: that in order to make certain the constitutional capacity of the United States to join such a world federal government steps should be taken promptly to obtain a constitutional amendment definitely permitting such action.

Eighth: that the American people should urge their Government to promote the formation of the world federal government, after consultation with the other members of the United Nations, either by proposing drastic amendments of the present United Nations Charter or by calling a new world constitutional convention.

SIGNERS OF STATEMENT

The signers were:

Frank Altschul, New York, banker, director of Council on Foreign Relations.

Douglas Arant, Birmingham, Ala., lawyer, formerly president of Alabama Bar Association and chairman of Committee on Bill of Rights of American Bar Association.

Hon. Robert P. Bass, Peterborough, N. H., former Governor of New Hampshire.

Henry B. Cabot, Boston, lawyer, chairman of "Committee of 1,000" on international organization.

Miss Marie J. Carroll, Boston, research director, World Peace Foundation.

Grenville Clark, New York, lawyer, author of pamphlets and

articles on world organization, secretary of the Dublin Conference.

Rev. Edward A. Conway, Washington.

Norman Cousins, New York, editor of Saturday Review of Literature.

Edward W. Eames, headmaster, Governor Dummer Academy; president, New England Association of Colleges and Schools.

Thomas K. Finletter, New York, lawyer, author, director of Americans United for World Organization.

Mrs. Richard T. Fisher, Boston, director Massachusetts Committee for World Federation.

Tom O. Griessemer, New York, executive secretary of Federal World Government, Inc.

Conrad Hobbs, Boston, director Massachusetts Committee for World Federation.

Palmer Hutcheson, Houston, Texas, lawyer, member American Bar Association Committee on World Organization.

Thomas H. Mahony, Boston, lawyer, consultant at San Francisco, chairman of Massachusetts Committee for World Federation.

J. A. Migel, New York, merchant, treasurer and director of Americans United for World Organization.

Edgar Ansel Mowrer, Washington, war correspondent and author.

Herbert F. Rudd, Durham, N. H., professor of philosophy, University of New Hampshire.

Richard B. Scandrett Jr., New York, lawyer, writer and editor, member American Mission on German Reparations, 1945.

Louis B. Sohn, Harvard Law School.

Foster Stearns, Hancock, N. H., former member Congress, former member of United States Diplomatic Service.

Robert Wheelwright, Wilmington, Del., landscape architect, member executive board of Federal World Government, Inc.

Major Perkins Bass, AAF, Peterborough, N. H., lawyer.

Lieut. Charles G. Bolte, New York, writer, veteran of British Army, chairman of American Veterans Committee.

Lieut. Kingman Brewster Jr. USNR, Cambridge, Mass.

Sgt. Alan Cranston, AUS, Washington, D. C., foreign correspondent, author "The Killing of the Peace."

Lieut. Marshall Field Jr., USNR, Peterborough, N. H., lawyer.

Lieut. Cord Meyer Jr., USMCR, Cambridge, Mass., writer on world organization, aide to Comdr. (now Captain) Harold Stassen at San Francisco.

Lieut. Michael Straight, AAF, San Antonio, Texas, writer.

Lieut. Gray Thorn, AUS, New York, lawyer.

There were also present conferees in the uniform of the United States who, by reason of that fact alone, did not participate in the conclusions of the conference. These resolutions and a full report of the conference are to be sent to the President, the Cabinet, all members of Congress and Governors of the forty-eight States and to the officials and the members of the United Nations Assembly.

While there was complete agreement upon the necessity for world government, there was a small minority which differed from the majority upon the matter of procedure and the timing of any steps to be taken. They reported as follows:

We do not join in the statement for these reasons:

1. We agree with the object and, with some reservations, with the structure of the organization envisaged in the resolutions. We think, however, that simulta-

neously with efforts to attain a world federal government, the United States should explore the possibilities of forming a nuclear union with nations where individual liberty exists, as a step toward the projected world government.

Owen J. Roberts,
A. J. G. Priest,
Michael Williams,
Stringfellow Barr,
Clarence K. Streit.

In addition to those signing the majority and minority reports, the following were present at some of the sessions:

Senator Styles Bridges of New Hampshire, member of Foreign Relations Committee.

Louis Fischer, New York, writer and lecturer.

Charles W. Ferguson, Pleasantville, N. Y., editor, Readers Digest.

John K. Jessup, New York, editor of Life and Fortune.

Lieut. Edward F. Mahony, AUS, Boston.

Donovan Richardson, Boston, managing editor, Christian Science Monitor.

Emery Reves, New York, publisher and author.

Winfield W. Riefler, Princeton, N. J., economist, professor at Institute for Advanced Study.

Beardsley Ruml, New York, chairman, Federal Reserve Bank of New York.

Henry D. Smyth, Princeton, N. J., Professor of Physics, Princeton University, author of official report "Atomic Energy for Military Purposes," 1945.

Capt. Wayne D. Williams, AUS, Washington, lawyer, winner of 1944 Ross Medal of American Bar Association for essay on world organization.

William B. Ziff, Washington, publisher and author.

It is expected that many others invited to the conference, but unable to be present, will adhere to the majority report.

TECHNICIANS' RELEASE URGED

Services Chided for Delaying Discharge of Talented Men

Special to THE NEW YORK TIMES.

WASHINGTON, Oct. 16—The armed services are delaying the return of badly needed technically trained persons to the universities and then into industry by delaying discharges of scientifically talented young men, it was charged today by Watson Davis, director of the Science Clubs of America.

Fifty-eight of the 117 male finalists picked in four annual sciences talent searches under the auspices of the Westinghouse Electric Corporation were being held in the service, Mr. Davis said, despite the fact that college scholarships were awaiting them.

"With the aid of their scholarships and the grants made under the GI Bill of Rights, they could be preparing themselves for careers of national importance in science," he said. "Instead, many of them are drilling on parade grounds in this country or are still serving abroad."

Scientists Oppose Secrecy

President Truman and Congress were urged yesterday to defeat the May-Johnson Bill, which would impose strict secrecy on the subject of atomic energy, in messages by three organizations including scientists and scientific workers in their memberships. Those signing the appeals included Dr. Harlow Shapley, director of the Harvard College Observatory; Dr. Kirtley F. Mather, Professor of Geology at Harvard; Dr. Harry Grundfest of Columbia and Professor Melber Phillips of Brooklyn College.

Radio Roundup:

**An Analysis
Of Bomb Bill**

**President's Politics,
Europe, Demobilization**

Johannes Steel (WHN) speaking of the atomic bomb says:

"The revolt of the scientists has been realized. The War Dept. has not succeeded in running through the so-called Johnson-May bill (see story, p. 4) which would, in effect, be the first step in the abolition of free thought in this country . . .

"The implications of that bill are such as to stagger the imagination. For if this bill were actually passed it would mean that Congress and the American people would simply have no voice in the control or guidance of the rule of atomic energy . . .

"The control would lie in the hands of a small committee, presumably of nine people, all of whom do not know what atomic energy is . . .

"The bill, of course, was written by the War Dept.

"This bill would, in fact, make out of American science a Nazi science. It would turn the scientists into a closed body, a sort of Fascist corporation. They would have the status of supermen, but at the same time would be completely at the mercy of a few brass hats, about whose politics very little is known."

Clifford Evans (WLIB) says:

"During the past six months in Washington, many of my newspaper friends have been discussing one question in particular about President Truman. They have been asking themselves, whether Mr. Truman is moving to the right or the right of the New Deal. . .

" . . . he isn't thinking at all in terms of right or left. He isn't concerned the least bit whether a proposal bears the label socialism, communism, liberalism or what-have-you. . .

"Our President wants to know whether or not the proposal under discussion, will work—and whether or not it will achieve its purpose—that of benefiting the nation as a whole.

"In other words, as Mr. Truman puts it himself—he wants to know whether the proposal is 'common sense.' That's all he cares about.

"It was only a few days ago that Mr. Truman was talking about the Tennessee Valley Authority (TVA). Mr. Truman summed up the entire situation when he said: 'The TVA is just plain common sense.'"

Frank Kingdon (WMCA) says:

"The most decisive fact about Europe at this moment is not a political one but a human one. It is hunger. Conference tables are important, but dinner tables with no dinner on them are decisive. Hunger is stalking Europe. The continent has only a fraction of its normal crops. Its transportation systems are broken down. Winter is coming.

"I doubt whether we have ever seen so dreadful a prospect as that facing this continent in the next few months. Millions will be

hungry. Hundreds of thousands permanently stunted. Tens of thousands will die.

"I do not believe the full horror of this outlook has registered in American minds. But it goes behind all politics, all national prides, all struggles for power. Deeper than any of them is the number one fact about Europe, and unless we do something effective about it, it will cancel out all our neat plans for constitutions and machineries of government."

J. Raymond Walsh (WMCA) says:

"Tomorrow (today) military leaders will come before Congress to report on demobilization . . .

"The red tape appears endless and meaningless. The men don't do the Nation any good lying about in idleness. And their own lives are being wasted. They are prevented from getting home, from finding employment, from planning an economic life for themselves, from marrying, and from taking up the civilian life they so richly observe.

"There is no reason whatsoever, so far as I can discover, why the red tape can't be cut . . .

"Then, it looks as though men are not being returned from overseas as fast as they could be if the Army really wanted to organize or the job . . . The fault is with the Army. The reasons include an unwillingness to reduce the size of their establishment. Concretely, thousands of top officers will have to be cut back in rank, in pay or mustered out if the Army is reduced . . . Then there are some military leaders who believe we should not demobilize at all. They think we shall be in for another war before and vested interest run through this many months are out . . . Politics question. They should be exposed."

**Dr. Oppenheimer Says Bomb
Cannot Have a Specific Defense**

By Stephen White

WASHINGTON, Oct. 17. — "There are no specific counter-measures against the atomic bomb, and there never will be," Dr. J. Robert Oppenheimer, who directed the research at Los Alamos, N. M., that led to the actual construction of the bomb, stated flatly today. The power of the weapon is so great, he said, that a new war might begin with 40,000,000 American dead in the country's twenty largest cities in the first few hours.

Dr. Oppenheimer has been officially credited by the War Department with "achieving the implementation of atomic energy for military purposes." He appeared today as one of three scientists testifying before the Senate joint subcommittee considering legislation which would lend government support to science.

His unqualified assertion was made when the committee put the question of counter-measures squarely before him. It may be, he added, that in time measures can be found to shoot down rockets or super-sonic planes, which would carry the bomb. But that time has not yet come.

Meanwhile, whatever atomic bombs made by other countries might be like, "ours cannot be exploded by any means until they reach their destination," the scientist said.

Because of this country's high degree of urbanization, the atomic bomb "has weakened the military position of the United States," he continued. Atomic weapons ten or twenty years from now will be very cheap. They will also be more powerful, he said.

Dr. Oppenheimer scoffed at the idea that production of the bomb would be limited to this country.

In fundamental research, the basis of any new weapon, this nation made no advances whatsoever during the war, he said. "For the most part, what happened during the war was not in any sense scientific work; it was the exploitation of skill, techniques, fundamental knowledge, and even to some extent of the human relations between scientists, all of which had been cultivated in the days of peace."

He warned that some sort of international agreement was essential, but as a scientist he refused to make recommendations in what he called a political matter. The present situation, he said, is "very close to intolerable. If I were a Russian scientist I would say, 'boys, we'd better get to it.'"

Peace time uses, to a limited degree, are around the corner, he said. The construction of 500,000 or 1,000,000-kilowatt electric plants, using atomic energy, can be begun in five years or less, if the government wants to encourage them. But their economic value would have to be made a subject of long study, he said, and in any case, they will supplement, and never eliminate, other forms of power.

Dr. Oppenheimer read to the committee a statement prepared by Enrico Fermi, whose pure research work at Columbia University supplied much of the basis for the development of the bomb. Dr. Fermi urged that no attempt be made to strangle science in secrecy.

The committee heard also a prepared statement by Dr. H. J. Curtis, representing the scientists at Oak Ridge, Tenn., who pleaded for an international agreement. "One false move in international diplomacy," he said, "might mean the virtual destruction of this country."

Atom Bomb Scientists Fight Bill For Control Sponsored by Army

Post Staff Correspondent

Washington, Oct. 18—Rank-and-file scientists who worked on the atomic bomb at Oak Ridge, Tenn., and at the University of Chicago told Congress today that the Army-sponsored May-Johnson bill for an atomic energy commission would set up dual government in the U. S. and "endanger" our relations with other nations.

The scientists appeared before the House Military Affairs Committee which closed hearings on the bill a week ago after listening to only five hours of testimony and which reopened hearings today after a barrage of protests from scientists and liberals in politics.

Witnesses today, including Dr. Leo Szilard and Dr. Harold C. Urey of the University of Chicago, Dr. H. L. Anderson, Dr. Arthur S. Compton and Dr. J. R. Oppenheimer, revealed:

1—That a Presidential directive during the war for U. S. atomic bomb experts to collaborate with Canada in a project on Canadian soil was "rendered ineffective" by the military men in charge of what was called the Manhattan District project.

Scientists "Ignored" Army Rules

2—That certain Army rules of secrecy among themselves had to be and were ignored by U. S. scientists working on the bomb.

3—That similar rules under the Johnson-May bill backed up by heavy new penalties would also have to be ignored by the scientists, but that violations could be held as a club to prevent criticism of the commission by the only persons who would really know how it was operating.

The May Johnson bill proposes a commission of nine members appointed by the President with the advice and consent of the Senate. The scientists who testified today pointed out that the commissioners could be part-time employees, with actual control left in the hands of a full-time administrator and deputy appointed by the commission. Dr. Szilard proposed that at least four Cabinet members should serve on it.

The Chicago scientist urged the entire handling of atomic energy be divided into three phases, each with a representative on the controlling commission. One would be manufacturing of light uranium and plutonium, the second would involve research and development and the third would concern only the atomic bomb.

Powers Too "Sweeping"

"The operation of the May-Johnson bill commission might reverse the line of our foreign policy," declared Dr. Szilard.

"During the war we had a directive in the project from the President to collaborate with Canada, but it was rendered ineffective by the executive officer of the Manhattan District project.

"I am afraid of the sweeping powers for undefined purposes which the bill provides," he said.

Hats Off!

Dr. J. R. Oppenheimer, America's leading expert on the atomic bomb, has taken a courageous stand against hasty adoption of the May-Johnson control bill. (Story on Page 3.) In a guarded, but far-reaching, statement, he warned the Senate Kilgore subcommittee by implication against letting atomic power fall under Big Business control or putting undue curbs on scientific advancement. Declaring that fundamental principles of atomic power are "no secret," he said exclusive American control "might interfere with international confidence." To Oppenheimer and his fellow scientists who have taken their stand against passage of any bill which might prove dictatorial:

Hats Off!

3 ATOMIC EXPERTS URGE WORLD CURB

NYT 10/18
Oppenheimer, Wilson, Curtis
Ask Senate Committee to
Hasten Against Menace

WARN BOMB IS NOT SECRET

Only a Few Missiles, It Is Held,
Could Put Any Nation
Out of Commission

By WINIFRED MALLON

Special to THE NEW YORK TIMES.

WASHINGTON, Oct. 17—Three experts on scientific research and development, who participated in the production of the atomic bomb, told a Senate committee today that the whole problem of atomic energy was of such magnitude and menace as to necessitate early control of further activities in this field by an international commission.

Dr. J. R. Oppenheimer, who directed the atomic research at Los Alamos, N. M.; Dr. Robert Wilson, formerly associated with him in that work and now Professor of Physics at Harvard, and Dr. H. J. Curtis, representing the scientists at the Clinton Laboratories in Oak Ridge, Tenn., appeared in support of Federal aid to scientific research before the joint committee on the proposed National Research Foundation, but their testimony developed into a round-table discussion of ways to control atomic energy.

[Dr. Oppenheimer was asked if it were a fair estimate that one atomic raid on congested United States centers could kill 40,000,000 Americans. "I'm afraid it is," he replied.]

All for World Curb

All three agreed that only international control would prevent the development of a situation in which the peoples of the world would be at the mercy of destructive forces they cannot even imagine.

"Because the atom bomb is not just another weapon, the devastating results of which must be seen to be believed," Dr. Oppenheimer said. "It is something against which no defense is possible, the 'secret' of which is no secret at all to the scientists of other nations, and the production of which by other nations is only a matter of time and no very long time at that, not more than a few years, probably, for some of them. And from the armament race that would almost certainly follow, the United States might or might not emerge the winner, nor would it greatly matter.

"It is not necessary for a nation to be able to produce more or bigger or better bombs but only for it to decide to proceed independently with its own atom bomb program, after which with very few bombs it could put any other nation, our own included, out of action.

Our Position Weakened

"Temporarily the advantage is ours, but actually the advent of atomic power has weakened the military position of the United States."

He agreed that international action was essential but doubted that our own activities in this field of research should be halted meanwhile.

However difficult the problem of internationalization, Dr. Curtis insisted no other solution was possible and no time should be lost in dispelling the growing suspicions of other nations engendered by the secrecy of our operations, by turning over to an international organization the control of all aspects of the atomic bomb.

"This should be done only after appropriate safeguards have been established which insure for us as well as for all countries of the world that atomic bombs will be used solely by an international commission for the preservation of peace," he said.

Oppenheimer Quits Post

LOS ALAMOS, N. M., Oct. 17 (U.P.)—The resignation of Dr. J. R. Oppenheimer, director of the Los Alamos atomic bomb project since its inception, was announced today. He was succeeded by Dr. Norris E. Bradbury.

THE NATION

Top Bomb Men Urge World Atom Control

By ELIZABETH DONAHUE Washington Bureau

WASHINGTON, Oct. 18.—The American people have at long last heard from the top scientists who know the intimate secrets of atomic energy. They are the men who built the atomic bomb.

In a packed, tense Senate hearing room 200 people listened to three scientists, including Dr. J. R. Oppenheimer, foremost American atomic expert, express or imply strong fears that in hasty adoption of the May-Johnson atomic control bill the people of the U. S. A. are triggering the starting gun for the most disastrous worldwide armament race in history.

Military experts and politicians have already had their say.

The scientists agree:

¶ That some domestic controls of the engineering aspects of atomic-bomb building are necessary, at least for a time.

¶ That the immediate discussion of international controls are even more vital—because, as Oppenheimer declared: "Discussion of the secret of the bomb is academic. It is only possible to keep our policy a secret."

¶ That no defense or countermeasure against use of atomic weapons is or will be developed.

¶ That the May-Johnson Bill is a recognition of the "terrible" possibilities of the bomb, but that its sweeping provisions can choke scientific research and put other nations on notice that the U. S. A. is "locking out" the world in its race to build as many bombs as fast as possible.

¶ That the bill grants broader powers than those hitherto given any Government agency, and that no nine-man commission could be expected to exercise them with complete discretion and wisdom.

(See articles which follow for details on the scientists' testimony and other news on the question of future development of atomic energy.)

Scientists Say Choice Is Chaos or Better Life for All

See No Basic Secret in

A-Power, No Bomb Defense

Washington Bureau

WASHINGTON, Oct. 18.—In their dramatic but restrained disclosures on the terrors and triumphs inherent in the power that made the atomic bomb possible, three foremost scientists have predicted two fateful alternatives for the U. S. A. in its handling of atomic energy:

¶ Worldwide chaos, or

¶ Giant strides toward improved human welfare and economic security.

The three scientists who yesterday appeared before the Kilgore Subcommittee of the Senate Military Affairs

Committee included Dr. J. R. Oppenheimer, acknowledged as the No. 1 man on the atomic bomb; Dr. H. J. Curtis, a key figure on the Oak Ridge bomb project, and Dr. Robert W. Wilson, who was closely associated with the bomb assembly job done at Los Alamos, N. M.

These men offered no quick panacea for either domestic or international atomic control. But in contrast to previous Army witnesses, including Secretary of War Patterson, the scientists presented some of the broad and specific problems inherent in the revolutionary May-Johnson Bill now pending in both Houses:

Here are some of the highlights of the testimony:

Technical and Counter-Measures Against the Atomic Bomb

Dr. Oppenheimer, questioned closely on the technical aspect of the bomb and the possibility of defensive weapons, declared: "Our bombs cannot be exploded before they reach their destination."

He said it is not "unnatural" that "many people squirm and try to say there is a counter-measure." The bomb, he added, "came to a world at the breaking point as far as weapons go."

He flatly asserted: "There never will be any counter-measure against the atomic bomb, although there may be a way to intercept the bomb carriers."

Dr. Curtis agreed.

"We scientists," he declared, "can offer no hope of a specific defense against the atomic bomb. Counter-

offensive warfare will not restore the ruins of our cities nor revive the millions of our dead."

Oppenheimer, asked by Sen. Warren Magnuson (D., Wash.) whether an atomic bomb can be secretly planted and detonated, replied, "That is technically possible."

Possibility of Developing Atomic Energy for Industrial Use

Although War Dept. spokesmen including Gen. Leslie Groves, the top military administrator of the bomb development, have indicated that the use of atomic energy for power development and industrial use is a long way off, the scientists do not agree.

Groves last week told the House Military Affairs Committee that practical industrial application is "at least ten years away."

But Oppenheimer, who is more intimate with the atomic processes, yesterday said development "is a matter of economic policy." Strongly hinting that big business could suppress the use of atomic energy to prevent revolutionizing our economy, he added it could be manipulated so "industrial development would never occur."

Actually, he said, "a million kilowatts for electric energy is not far off, possibly five years or less. But to fit this into our economy may take a long time."

He told the committee, "There have never been great inventions which did not supplement existing machinery."

Dr. Enrico Ferme, an Italian physicist of world renown, confirmed Oppenheimer's belief in a written statement to the Kilgore group. "The industrial potentialities can be exploited," Ferme wrote.

U. S. Secrecy and Fear Of Foreign Reprisals

Although the scientists, who are now subject to strict military authority, carefully skirted direct attacks on the Army's May-Johnson atomic control bill, they strongly implied they fear its consequences here and abroad.

Oppenheimer, referring to a sec-



Dr. J. R. Oppenheimer, whose resignation as director of the Los Alamos, N. M., atomic bomb project, which he had headed since its inception, was announced yesterday as he testified in Washington.

tion of the bill which could forbid the teaching of the nuclear energy theories, said, "It could stop science in its tracks."

He added, however, that the bill "does not create the serious problem arising from the atomic bomb."

He said that the bill attempts to recognize the "terrible" problems growing from the atomic bomb, but "does not insure whether these projects will be run well or badly."

Curtis, avoiding a direct reference to the bill, told the committee the attempt to keep atomic research secret "would mean secret laboratories, an elaborate military intelli-

gence and would serve notice on other countries we are developing atomic energy for military purposes. All international relations would be based on a diplomacy of fear."

"All fundamental ideas involved in the bomb," Curtis said, "were known before the war or revealed in official releases since. The only remaining secrets are technical details which any intelligent group of scientists and engineers could work out in a short time."

Oppenheimer contended "there is much lore and secrecy" on the bomb engineering which could be retained even if it "might interfere with international confidence."

But he added:

"The whole question is no secret. Therefore, it cannot be either kept or given away. If we attempt to retain what we know, other nations will say 'We will do it without you'."

Curtis, in a guarded reference to the Army's control bill, said, "Science cannot grow as a mere appendage to our defense machinery."

In an oblique attack on the unlimited powers granted a nine-man commission under the bill, Oppenheimer pointed out that "It could take over control over all transportation." Raising the question of the broad discretion the commission members would have he added, "Of course, if I were a member I would say we are not interested in taking over transportation."

Only Real Hope Is International Agreements

Oppenheimer, declaring the "advent of the atomic power has weak-

ened our military position," warned that "the U. S. has only a momentary strengthening of military advantage."

"The real problem," he said, "is political, and our Secretaries of State and Foreign Ministers are the ones who must grapple with it."

He told the committee that the scientists who developed the bomb were "unhappy" and keenly aware of their heavy responsibility. But he said atomic weapons "are the best arguments the scientists can advance for new and reasonable relations between nations."

None of the scientists offered any specific suggestions for revising the May-Johnson Bill.

But informed members of Congress explained this two ways:

¶ The measure is not in the hands of the Kilgore Committee, which has a science foundation bill under consideration. And it would not be either proper or constructive for the scientists to offer suggestions to the wrong committee.

¶ The scientists are strongly inhibited by the Army, which virtually wrote the May-Johnson Bill. As key member in the Army's development of the atomic bomb, the physicists like Oppenheimer are loaded with "military secrets" and can be prosecuted under the Espionage Act for divulging them. The fear of reprisals, it is said, extends far enough to make the scientists extremely reticent on the subject of atomic bomb legislation.

Today Oppenheimer and two other atomic experts are expected to appear before the House Military Affairs Committee to offer direct testimony on the May-Johnson Bill.

'One World' Held Sole Bomb Defense

By BARNETT BILDERSEE

Five years. That is mankind's deadline. In that time man must have decided to pool and control his terrible knowledge of atomic power or pay the price of a catastrophic war which could cost the U. S. A. more than half its civilian population. In perhaps 10 years even a reviving Germany or Japan could have the new weapon.

Eventually, man must create a world government for mutual self-defense against it. Science foresees no other defense. There is no other alternative.

That is the overwhelming consensus of the scientists who un-

locked atomic power. It was stated last night by Richard Present of the Manhattan District Project, part of the research program which produced the first atomic bomb.

Present, a Columbia University physicist, spoke at a dinner in honor of President Juan Antonio Rios at the Biltmore Hotel. It was sponsored primarily by the Free World Assn., which, since the development of the atomic bomb, has advocated the transformation of the United Nations into a system of World Government.

Michael Straight, an editor of the New Republic who until recently was a B-17 pilot in the AAF, went beyond what Dr. Present

called only a "very rough, schematic outline of international control."

Straight declared that since we have the atomic bomb, it would amount to a declaration of war if we were to hold it in one hand and a plan for its control in the other. Therefore he proposed a three-part program:

¶ President Truman should call first the United Nations Security Council, then the United Nations Organization as a whole, and ask them for proposals for controlling the bomb.

¶ As soon as the United Nations Assembly meets, the people should

MORE

CONTINUED

Deadline

recommend amending its charter to provide controls they hope will come eventually but now to strengthen the executive, legislative and judicial branches so that an international armed force will not be an irresponsible force without civil authority behind it.

¶ A general program of education among the American people toward an amendment to our Constitution to permit the U. S. A. to enter a world government.

Dr. Present said that such a step was an ultimate necessity, that each nation must be prepared to relinquish part of its sovereignty. The more that is relinquished, he said, "the more effective it can be in the prevention of war."

Banquet guests who just had exchanged pleasant toasts with the Chilean president were unprepared for the startling warning which came so quietly and undramatically from slight, blond, youngish-looking Dr. Present.

The scientist declared it would be "utter folly" to imagine that the defense of the U. S. A. could be secured by itself alone. Because the May-Johnson Bill (see analysis on this page) makes that assumption, he declared his opposition to it. He called it "altogether inadequate if not positively dangerous" unless supplemented by other legislation. Dr. Present said:

"It is, of course, impossible to predict when other countries, without help from us, will be able to turn out atomic bombs. . . . The consensus of informed opinion is that other major powers will have atomic bomb plants in about five years, and both Britain and the USSR sooner.

"The smaller powers and possibly a re-emergent Germany or Japan could be expected to have caught up in about 10 years.

"It is important to realize that there is no foreseeable defense that will be 100 per cent effective against atomic explosives. . . . The public should beware of press releases that convey a false sense of security. The inhabitants of our great cities have no protection against the fate of Hiroshima and Nagasaki . . .

Bigger Bombs

"It is likely that further developments will result in bombs of vastly greater destructive potential than the ones used against Japan."

Dr. Present disclosed that the atomic bomb came into being because many British and U. S. scientists "lived in constant apprehension of an atomic bomb attack that might have wiped out London, Washington or New York within a few minutes."

"In the absence of any defense, the Germans started to use atomic bombs. Thus any moral scruples that we may have had about developing a weapon of such great destructive potentialities were overweighed by considerations of military necessity."

For the future, he dissented from the recent speculation of Dr. Irving Langmuir, General Electric scientist, who predicted that by 1965 the Soviet Union might be able to attack this country with enough atomic explosives to destroy us.

Dr. Present said: "I look for trouble in another direction and in the much nearer future. . . . Certain of the have-not nations that are now classed as

No Defense

By United Press

LOS ALAMOS, N. M., Oct. 18. — Maj. Gen. Leslie Groves, the Army's over-all director in development of the atomic bomb, says America must not be lulled into a sense of false security by statements that a defense against the atomic bomb has been developed.



Gen. Groves

"I know of no defense," he said in an address to scientists and workers who made the bombs dropped on Japan at the once-secret Los Alamos project near Santa Fe.

He styled as a "disservice to national thinking and national security" any statement that countermeasures exist.

small or defeated powers in 10 years may be in possession of a few atomic bombs.

"Such a nation might then embark with impunity on a campaign against its neighbors. The U. S. A. would be warned not to interfere lest irresponsible patriots detonate smuggled atomic explosives in one of our cities.

"International blackmail could thrive on an unprecedented scale."

International Control

First step in what the scientists deem essential, Dr. Present said, is rigid international control of "fissionable" material and the processes for creating nuclear power.

"It is unrealistic," he declared, "to imagine that a mere agreement among the nations to renounce the use of atomic weapons will prevent their use in a future war. The least that can be done is to establish an international commission of experts under the United Nations Organization with the right of free access to the laboratories, mines and plants of member nations . . . at any time . . .

"All scientific discoveries and technical information should be made available. . . . No nation shall be permitted to hoard fissionable material or bombs . . ."

Repeatedly, Dr. Present emphasized that even such measures were only a hasty, temporary stopgap. Ultimately, he said, the only security lies in "the elimination of war through a world government."

Bomb Doesn't Scare Admiral

Vice Adm. Frederick C. Sherman, who probably has seen more duty afloat in the Pacific than any other flag officer, doesn't have much faith in scientists' claims that the atomic bomb can be made and used by other nations.

Sherman, in an interview aboard the carrier Enterprise, his flagship, which docked with the rest of his Task Force 62 in the Hudson yesterday, told how "carrier task forces in the Pacific spearheaded every drive and blazed the way into Tokyo."

"Naval aviation can carry the atomic bomb as well as any other type of aviation," he said. "Our naval carrier power is offensive rather than defensive. We'll hit the enemy with atomic bombs, and when we go after them we'll take our chances of his hitting us first."

Scientists Who Worked on Project Take Apart Bill for Atom Control

Say Commission Would Be Given Powers Independent of Law

Washington Bureau

WASHINGTON, Oct. 18.—The following is from an analysis of the May-Johnson Bill, for domestic control of the future development of atomic energy, by a group of scientists who worked on development of the atomic bomb. In making their analysis available here yesterday to PM, the scientists insisted that their names not be published. The Bill, they said, was written by the War Dept.

Unprecedented powers of control over private property and individuals are given to the administrator of the Atomic Power Commission under the terms of the identical Johnson (Senate) and May (House) bills now under consideration in both houses. The bill sets up a commission of nine men working as dollar-a-year men who nominally supervise the activities of an administrator and deputy administrator who would be given complete "plenary" powers over every phase of atomic power from prospecting for ores, through all research in universities or elsewhere, through development of peacetime uses and including military applications.

Independent of Law

A reading of the bill reveals that the commission and its administrators would be provided with powers making them independent of law in wide areas. Some important items taken from the bill are:

¶ The strongest peacetime controls over private citizens ever contemplated in Federal law is provided in the powers given the commission to establish its own detailed secrecy rules. The bill provides that these rules shall apply to all persons having knowledge of the work because of their activities "before or after the passage of this Act" and therefore brings under its control the thousands of individuals who have worked on the atomic bomb project during the war.

¶ The commission is given power to make and modify contracts and agreements with the extraordinary provision that this may be done "without regard to the provisions of law relating to the making, performance, amendment or modification of contracts."

Make Regulations

¶ The commission is empowered to make regulations governing all activity in the field of atomic power which are binding on individuals but which nevertheless may themselves not be published as is implied in the provision that the regulations are to be published only "when not inconsistent with considerations of security."

¶ After enumerating very great broad powers for the commission, the bill in order to make absolutely sure that the commission shall be totally unhampered provides it with the power "to take all such other action and exercise all such other powers as may be necessary or appropriate for the exercise of the

powers and performance of the functions provided in this Act."

¶ The commission is empowered to require individuals to declare all property interests in this field and the administrator is empowered to acquire for the Government by forced sale any private properties which the commission decides it needs. This section of the bill explicitly extends this power to ores and minerals, real property, technical information of all kinds, patents, agreements and rights of all kinds.

¶ The commission is granted authority to conduct exploration for minerals on all lands "with or without the consent of any person holding any interest in the property so affected."

¶ The bill explicitly forbids the conduct of research in the field of nuclear physics to be carried on in any Government agency or in any university or private scientific laboratory without permission from the administrator.

¶ The administrator is authorized to carry on research and further activities in this field and is given complete custody of the enormous facilities built up during the war by the Manhattan District of the Corps of Engineers of the Army. In this connection the bill gives him two more extraordinary powers: It provides that he may employ

personnel without regard to the Civil Service laws "or any other statute."

It sets aside normal Government machinery for auditing the operations of Federal agencies with the provision that the general accounting office "shall not disallow credit for, nor withhold funds because of any expenditures which the commission shall determine and certify to have been necessary to carry out the provisions of this Act."

¶ The most extraordinary provision of the bill is that giving the administrator power to dismiss any person not only from employment from the agencies directly under the commission, but also "from employment by other Government agencies, or the agents, holders of contracts, or licensees of the commission." This power is given the administrator over individuals whom he accuses of violating a secrecy regulation "without regard to criminal prosecution or conviction."

¶ The members of the commission, although appointed by the President with Senate confirmation, could only be removed from office by Act of the President and only after he was prepared to make a case that the member was guilty of "neglect of duty, malfeasance in office or because continuance of the member in office would be inimical to the national interest."

By Albert Deutsch

'Atomic Power Politics' and The Issue of World Peace

The atom-smashing laboratory grubbers, whose collective genius fashioned the most effective instrument of slaughter in all history, are rushing out of their cloistered retreats to shout a last warning to a dazed generation before it topples into the abyss. They are tearing off the muzzle of a military imposed silence.

What they are trying to tell us is infinitely more important, in terms of our own lives, and the very survival of humankind, than all the rest of the day's news combined. If their collective voice is heard

above the din, and heeded, we may be spared untold destruction and suffering. We may then enter the Atomic Age toward limitless progress instead of committing global suicide at its threshold.

What these scientists—hundreds of them, all participants in the epochal creation of the atomic bomb—are telling us may be simply summarized:

¶ The "secret" of the atomic bomb is no secret at all. The harnessing of atomic energy—the culmination of years of shared research by the scientists of many lands—is not and cannot be a nationalistic monopoly any more than science itself can be the exclusive property of any single nation. Any foreign policy based on the premise that "we" have the "secret" safely tucked away would be built on the sands of delusion.

Global organization for global peace is the only secure defense possible against the atomic bomb.

The development of this and other lethal weapons confronts humanity with the now inescapable choice: One World or None.

What the scientists are protesting, specifically, is the May-Johnson Bill in Congress, which sets up a military-dominated nine-man commission with virtually dictatorial powers over the whole field of atomic research. They have won an initial victory of great importance in breaking through Army censorship to get a hearing. Their aims are two-fold: scientific freedom and world peace.

The corollary implications are clear, and the scientists, in their role as citizens, have not hesitated to point them out. Recriminations, antagonisms and mutual distrusts between the powers lately allied in a victorious struggle are the explosive ingredients which, when brought to proper heat, may set off atomic warfare until the civilized world is pulverized. The human heart must catch up with what the human mind has wrought; a divided civilization must key itself to a one-world science.

Neither the moral imperative nor practical necessity permits an alternative to the welding of permanent world peace. This is the moment of decision. That's what the scientists are trying to tell us, out of their wisdom and humanity.



Deutsch

Physiker und Chemiker in Amerika betrachten ihre Wissenschaft viel mehr als einen 'job', als das im Grossen und Ganzen in Europa der Fall ist, und besonders in den letzten Jahrzehnten sind die Naturwissenschaften mehr und mehr unter den direkten Einfluss der grossen Industrieunternehmungen gefallen. Eine wachsende Zahl von Wissenschaftlern wurde in den Vorkriegsjahren von solchen Konzernen wie die Bell Telephone Company, Western Electric usw. angestellt und Studenten werden schon vor ihrem Doktorat durch Stipendien und 'scholarships' an verschiedene Konzerne gebunden. Praktisch hatte dies zur Folge, dass die Forschungsarbeit von fundamentalen Prinzipien auf technologische Details abgelenkt wurde, dass ein sonst nirgends erreichter Grad der Ausbildung technischer Prozesse von einem relativen Mangel an grundsätzlichem Fortschritt in der 'reinen Wissenschaft', der Basis für den technischen Fortschritt, begleitet war. Es ist bezeichnend, dass die technischen Probleme der Atombombe alle in Amerika von Amerikanern bewältigt wurden, während die grundsätzlichen Experimente und theoretischen Erwägungen entweder in Europa oder, wenn in Amerika, grösstenteils von emigrierten europäischen Physikern wie dem Italiener Enrico Fermi und dem Dä-

nen Niels Bohr gefunden wurden.

Ideologisch ging die Entwicklung parallel. Der Physiker und Chemiker, der für den Profit eines Grossunternehmens arbeitet, entwickelt sich leicht zu einem wissenschaftlichen 'Businessman', er vergisst den Zusammenhang zwischen seiner Arbeit und der menschlichen Gesellschaft, er vergisst die prinzipielle Aufgabe aller Wissenschaft: die Ergründung und Beherrschung der Natur und damit die Förderung des sozialen Fortschritts. Sein Horizont schrumpft, er wird ein technologischer Fachmann und entwickelt Scheuklappen.

Aber selbst die besten Scheuklappen funktionieren nur bis zu einem gewissen Grad. Einer Atombombe sind sie nicht gewachsen, und die amerikanischen Physiker finden sich heute in einer Situation, in der sich die bequeme Vorstellung der Separierung von Wissenschaft und Gesellschaft nicht mehr aufrechterhalten lässt.

Die Physiker sind heute in einer Lage nicht unähnlich der des Goetheschen Zauberlehrlings. Und sie protestieren.

Vor einiger Zeit gab man an der Universität Chicago ein Bankett für die Physiker, die für die Produktion der Atombombe verantwortlich sind. Die Generäle und Obersten, unter deren Aufsicht die wissenschaftliche Arbeit vor sich

ging, waren dabei. Nach dem Essen stand Dr. Samuel Allinson, der Leiter der Chicagoer atomischen Forschungsgruppe, auf und hielt eine etwas unerwartete Rede.

Er und seine Kollegen, meinte Dr. Allinson, seien mit der geplanten Nachkriegsverwertung ihrer Forschungsarbeit unzufrieden. Erstens leuchte ihnen die Notwendigkeit der weiteren Geheimnistuerei über die wissenschaftlichen Prinzipien der Atomenergie nicht ein. Es sei völlig unrealistisch zu glauben, dass die Vereinigten Staaten auf die Dauer ein Monopol der Atomenergie aufrechterhalten können. Jeder Staat, der bereit sei, das nötige Geld auszugeben, könne in höchstens zwei Jahren ebenso gute und vielleicht noch bessere Atombomben produzieren. Die Ausnützung der unabsehbaren Möglichkeiten einer Verwertung von Atomenergie zu friedlichen Zwecken werde aber durch weitere Geheimhaltung erschwert und jedenfalls verzögert. Die Alternativen: Entweder ein Forschungs- und Rüstungswettrennen zur Entwicklung katastrophalerer Atomwaffen, oder eine Zusammenarbeit der Wissenschaftler aller Vereinigten Nationen in konstruktiver Forschung. Die offenbare Absicht gewisser politischer Kreise, die Atombombe als Druckmittel in diplomatischen Verhandlungen zu verwenden, sei nicht nur kindisch, sondern auch gefährlich.

Zweitens sei es höchste Zeit, auch für die friedliche Forschungsarbeit über Atomenergie etwas Geld auszugeben. Vor einiger Zeit hatten die Physiker an das War Department ein Memorandum gerichtet, in dem konkrete Vorschläge in dieser Richtung gemacht wurden. Nachdem Billionen auf die Produktion der Atombombe verwendet worden waren, könnte man für etwa hundert Millionen Dollar eine ganze Stadt jahrelang experimentell mit atomischer Energie beliefern. Elektrizitätswerke, Gaswerke und Zentralheizungsanlagen könnten alle mit Atomenergie betrieben werden. Es sei klar, meinte Dr. Allinson, dass sich in den ersten Jahren dieses Experiment finanziell nicht rentieren würde. Aber nach etwa fünf Jahren werde die Sache auch finanziell rentabel sein. Und was sind Hundert Millionen, verglichen mit den Billionen, die für Kriegsforschung ausgegeben wurden? Dieses Memorandum wurde vom War Department ignoriert.

Dr. Allinson schloss seine Ansprache mit der Bemerkung, dass seine Kollegen am liebsten sofort zu ihrer Forschungsarbeit für friedliche Zwecke zurückkehren wollten. Falls das War Department auf weiterer Heimlichkeit und weiterer Beschränkung auf Kriegsforschung bestehe, sei es leicht möglich, dass er und seine Kollegen eine lange und militärisch vollkommen unfruchtbare Untersuchung über die Farben in Schmetterlingsflügeln beginnen werden, die ihnen gar keine Zeit für irgendwelche andere Arbeiten lassen werde. Diese Drohung eines Physikerstreiks dürfte in den Annalen der amerikanischen Physik wohl einzig dastehen.

Was immer die zukünftige Einstellung der Regierung und der Industrie zur weiteren Atomforschung sein mag und was immer man über einige Details in der Einstellung Dr. Allinsons denken mag, die Tatsache, dass sich die Wissenschaftler für die sozialen Konsequenzen ihrer Arbeit zu interessieren beginnen, ist ein gutes Zeichen für die Zukunft. **PAU**

Edgar Mowrer On World Affairs

Understanding the Atomic Bomb

NYP 1918

By Edgar Ansel Mowrer



Present public discussion of the atomic bomb is confusing the American people. Such confusion is dangerous. Yet the average citizen cannot hope to discover the true situation by himself. Where public men differ so widely whom is the citizen to trust?

There are two quite irreconcilable theses about what the bomb means.

The first, as expressed by Dr. Vannevar Bush, director of the Office of Research and Development, holds that "the atomic bomb differs in magnitude but not in kind" from existing weapons. It is just "vastly more powerful, requiring new and correspondingly powerful defense controls."

This is the view of Secretary of the Navy Forrestal and of Gen. Marshall. It has been expressed by Gen. Groves, military head of the group that built the bomb. It inspires the reassuring statements that "adequate defense" can or will be found. The sort of legislation President Truman recommended to Congress seems to show that he has been converted to this view.

Says the Major General

Partisans are extremely active. Recently a major general informed an influential Senator that the atomic bomb did not "save a million American lives" (as the Administration had stated) because the Japs were already beaten by orthodox methods.

Another "reassuring" statement is that Americans could defy atomic bombs in enemy hands if they would, at the cost of \$15,000,000,000 annually for the next 20 years, disperse their key industries and bury their arsenals. Our present cities, it appears, should be replaced by new and smaller "one-dimensional" towns 30 miles long and less than a mile wide.

Radical change in the national defense is unnecessary. Surely the future of the bomb can be trusted to the men who so brilliantly won the last war. The average citizen does not need to be anxious. There are no radical political conclusions to be drawn.

Then There's the Other View

Unhappily, there are other voices. They come from the scientists who accomplished the miracle of building the bomb. What do these scientists say?

First, they deny to any but nuclear physicists like themselves the right to judge the potentialities of atomics. Gen. Groves, they say quietly, is a civil engineer; Vannevar Bush an electrical engineer, George Marshall a general, Secretary Forrestal a banker. If the people want the facts, let them listen to the few score Americans who know most. The scientists speak like this:

The atomic bomb is not another weapon like the others. It is not just another bomb. It is totally different. The explosive possibilities of TNT are chemically limited and essentially like the fire in your grate or the metabolism within your body. The energy of the atomic bomb is not chemical but cosmic. It is something that heretofore has been wielded by God alone. It is the creative force that shaped the stars, that makes and unmakes suns. It could destroy creation.

They say further that bombs will soon be made twenty to a thousand times more powerful than those which atomized Hiroshima and Nagasaki. Against such force there can be no adequate defense. Counter missiles are impractical. Dispersion can lessen but cannot prevent frightful destruction and slaughter. A sudden attack might bring even a powerful country to its knees in two hours. Reprisal—is possible—is the only possibility.

They say all competent indus-

trial peoples will soon be making atomic bombs—unless prevented. The only remedy is to prevent the use of the bomb by anyone. The only solution is world government to enforce peace under law.

So speak the men who built the bomb.

Who are right—the military men or the scientists? We citizens do not know. The American Congress does not know. But it is up to Congress to find out. The answer is far too momentous to be left to any individual, even the President of the United States.

Here is one way Congress could properly go about it. Let the House of Representatives immediately establish with the Senate a Joint Committee. Let this Committee invite to Washington spokesmen of the scientific groups that built the bomb and other nuclear physicists along with such industrialists, engineers and military people as may care to testify.

Let the People Know

Let the committee lay before these men in writing all the questions which any members of either House may care to have answered—not the secret of the bomb, but its implications. Let the witnesses answer in writing, collectively or individually.

Let the committee study these answers and then summon contradictory witnesses to appear at secret hearings to amplify and explain their reason for disagreement. Let the committee then commit its findings and conclusions to a secret report.

And finally, let the committee transmit its recommendations concerning the care and disposal of the bomb to the two Houses of Congress for appropriate legislation.

Let the committee be sure to tell the people such of its conclusions as can be made public without danger to the United States.

(Press Alliance, Inc.)

Foster Urges Atomic Secret Be Given U.N.O

Red Chief Says 'Imperialists' Want U.S. to Rule World; He Again Assails Byrnes

WASHINGTON, Oct. 18 (UP).—William Z. Foster, Communist leader, said today that "imperialist reactionaries" in this country want the United States to run the world but "the peoples of the world" will not permit American domination.

He told the House committee investigating un-American activities that retention of the atomic bomb secret is the "greatest political mistake we have ever made." He advocated turning it over the United Nations organization.

"Why do we want a big navy and a gigantic peace-time army?" he asked. "Why do we want to retain the secret of the atom bomb? Who are we going to fight? We are heading for world domination. Well, the Latin-American countries won't stand for it, the new democratic governments of Europe won't stand for it, and Russia doesn't like it."

Mr. Foster's suggestion that Russia and the other Allies be given a hand in control of Japan aroused Representative Karl E. Mundt, Republican, of South Dakota, who asked whether Mr. Foster favored "giving Russia the same amount of influence in Japan as we have in Romania and Bulgaria."

In his second day of testimony Mr. Foster renewed his attack on Secretary of State James F. Byrnes. He said that Mr. Byrnes "wrecked" the Foreign Ministers Conference in London—"deliberately did so."

PRINCETON, N. J., Oct. 18.—Leadership in basic as well as applied science is a necessity for the United States if it is to save itself from destruction, Dr. Harold W. Dodds, president of Princeton University, said today in a report to be made formally to the university trustees on Oct. 25.

Dr. Dodds said that the great scientific developments of the war, radar and the atomic bomb, revealed little or no new theoretical knowledge, and he quoted scientists as saying that these developments have about exhausted the existing stockpile of unapplied theoretical science.

He asserted that it was European scientists for the most part who made possible radar and the atomic bomb through their pioneering in most abstract theory—"which to all practical people has no contact with real life"—and said:

"It is wise, therefore, to assume that the next war will be won through the application of abstract scientific discoveries undreamed of today but packed with great practical possibilities as they unfold.

"These are not fanciful assumptions. They are so real that America will ignore them at the risk of her life."

He emphasized that America in scientific discovery "must end her servitude to other people," and to do so must match or exceed the money spent on science and engineering in Russia or any other country.

Government must aid science, he said, and he spoke in favor of the report of Dr. Vannevar Bush, head of the Office of Scientific Research and Development, advocating to President Truman government aid to science reaching the sum of \$122,500,000 within five years.

But, he said, this must be supplemented with private donations to universities, which must be free to conduct long-term investigations of a fundamental nature, not always possible under government grants.

Atomic - Bomb Experts Split On Control Bill

Szilard, Anderson, Compton and Oppenheimer Give Views at House Hearing

By Stephen White

WASHINGTON, Oct. 18.—Scientists who aided in development of the atomic bomb appeared today before the House Military Affairs Committee to express their opinions on the May-Johnson bill, which would place all work in atomic energy under rigid and far-reaching national control. Their appearance followed nine days of growing criticism of the committee's action in limiting hearings on Oct. 9 to four Administration witnesses and immediately closing the hearings.

Of the four experts who appeared today, all of whom were intimately connected with the bomb project, Dr. Leo Szilard and Dr. H. L. Anderson opposed the bill as it is drawn. Dr. A. H. Compton supported it with qualifications, and Dr. J. Robert Oppenheimer urged its passage virtually as it stands.

However, there was a large area of agreement among the four men. All agreed that the bill should be rephrased in a manner that would convince scientists of its essential sympathy with continued scientific research, as freely organized as the safety of the nation will permit.

While the hearing was in progress President Truman, in a press conference, urged quick passage of legislation.

Dr. Szilard, a prime mover in the early days of the atomic bomb and now associated with the University of Chicago in atomic-energy work, was most specific in his attack on the bill as drawn. The security regulations, he said, would make it impossible for a scientist to criticize the administrator set up under the May-Johnson bill, since the administrator could then use the absolute provisions of the bill to discharge the scientist, without right of appeal, and effectively prevent him ever working again in his field.

The bill, he said, would perpetuate the conditions under which scientists worked during the war, when they were obliged to break security regulations in order to carry on their work in the most efficient manner.

In the Senate, the May-Johnson bill remained tabled, and consideration of a resolution introduced by Senator Brien McMahon, Democrat, of Connecticut, establishing a special committee for consideration of atomic-energy bills, was held over for consideration next week.

Representative Jerry Voorhis, Democrat, of California, joined the scientists in urging deep consideration of the international problem, and recommended that the nine-man commission, set up under the bill, be full-time government employees, paid at the rate of \$50,000 a year.

General H. H. Arnold, chief of the Army Air Forces testifying before a joint Senate Military Affairs - Commerce Subcommittee, said that future air fleets equipped with robot atomic bombs would be able to destroy a nation before any defense was possible.

At a special press conference that coincided with the hearing a group of atomic-bomb scientists urged that the May-Johnson bill be defeated. Its passage, they said, would "serve notice" on other countries that this nation has embarked on an armament race, because of the stringent security regulations embodied in the bill. Passage, they said, also would drive scientists from the field of nuclear research.

The group was led by Dr. Harold C. Urey, formerly of Columbia University; J. J. Nickson, of Chicago; Dr. T. H. Davis and H. J. Curtis, of Oak Ridge, and Dr. Anderson.

SCIENTIST GROUP HITS ATOMIC BILL

Drs. Urey, Anderson, Curtis and Szilard Say Plan Would Make World Fear Us

10/19 NY
By WILLIAM S. WHITE

Special to THE NEW YORK TIMES.

WASHINGTON, Oct. 18.—The Administration's bill for nationalizing atomic energy came under vigorous attack today from a group of scientists who were closely associated with developing the atomic bomb, and it appeared tonight that its chances of passage in its present form had been materially lessened.

The House Military Affairs Committee, again over the protest of a number of atomic scientists, once more closed its public hearings later in the afternoon, some hours after President Truman had told his press conference that he hoped Congress would act without undue delay. He added that he thought the Administration measure, to set up a Federal atomic commission with enormous powers of control, was substantially in line with his recommendations and he believed it was satisfactory, although he had not studied it in all detail.

Before the House committee, and in a press conference at the office of Senator Taylor, Democrat of Idaho, the bill's critics denounced it as tending to freeze rather than to promote scientific experimentation, as nationalistic and as justifying other countries in taking an attitude of fear and suspicion toward the United States.

Special Senate Board Planned

In the Senate, meantime, a resolution by Senator McMahon, Democrat of Connecticut, for the creation of a special Senate committee of nine to handle all atomic energy legislation was reported to the floor and the way was opened for final Senate action next week.

Presenting a report of the Interstate Commerce Committee approving the McMahon plan, which was designed to resolve a jurisdictional dispute which had stalled all legislation on the subject in the Upper House, Senator Lucas, Democrat of Illinois, normally an Administration supporter, criticized the Administration's handling of the problem. He declared himself "concerned" at the censorship which had been placed on civilian scientists by the War Department, and added:

"I am unalterably opposed to the military having complete control over atomic energy. And all information indicates that that is what the Army would like to do."

Meeting correspondents in Senator Taylor's office, Dr. Harold Urey, who worked at Columbia University and elsewhere as one of the pioneers in the atomic bomb, asserted, with the general approval of four of his colleagues, that the administration bill would "create a potential dictator of science" and would have the effect of "serving notice upon the world that we were opening an armaments race."

Dr. H. L. Anderson of the New Mexico atomic project, who earlier in the day had testified before the House Military Affairs Committee, declared that the measure would greatly impede any effort to create international control of the atomic bomb.

"If we are to exist at all," he added, "the only solution is some kind of international peace arrangement based upon mutual trust. This bill seeks to cloak what might be a great military preparation."

Dr. Curtis Criticizes Bill

Following this same line, Dr. H. J. Curtis, another who helped develop the atomic bomb, asserted:

"The whole tone of the bill is such that if I were a scientist in some other country assuredly would say to myself: 'Those fellows over in the States are getting ready to bomb us in a big way. Any foreign country is going to read into it that we are an essentially aggressor nation.'"

Dr. Urey declared that he thought the matter of security, of restricting the secret of the bomb, should be left largely to the scientists themselves, asserting that he believed it would be better in the end for this country to take a policy leaning toward "openness of information" rather than the reverse.

Another of the group of scientists hostile to the bill, Dr. Leo Szilard of the University of Chicago, in his testimony before the House committee, criticized the War Department for having made public the H. D. Smyth report on the development of atomic energy. Agreeing with this criticism, Dr. Anderson told the committee that he thought Maj. Gen. Leslie R. Groves had been "bold" in making public so many secrets.

Mention Made of Russia

Dr. Szilard, who was sharply questioned by Representative Thomason, Democrat, of Texas, in an effort to show that he had been unwilling to cooperate with the War Department in the details incident to granting the Government patent rights to a number of his inventions, observed to the committee that some were talking as though the one decision to be made was "to make atomic bombs and blast hell out of Russia before Russia blasts hell out of us."

Protesting the decision of Chairman May of Kentucky again to close the public hearings of the Military Affairs Committee, Dr. Urey asserted that no scientist who was intimately connected with the actual making of the atomic bomb had been consulted when the Administration bill was prepared, and that many others wanted to be heard.

Expressions of attitude from among members of the committee indicated strongly that demands would be made for many amendments.

To the oft-put question as to means of defense against the atomic bomb, Dr. Szilard said that the only defense of any practicality would be in relocating concentrated populations and putting certain plant facilities underground.

Reminded that there had been some discussion of the possibility of detonating the atomic bomb short of its objective, he responded:

"If some one invented a device to do that I would undertake to develop within fifteen minutes a counter-defense; that is, a defense against that defense."

In another development of the day, Gen. H. H. Arnold, commanding general of the Army Air Forces, said today that the air forces of a country were now its first line of defense, and that the United States, for its own security and the peace of the world, must maintain its position as the pre-eminent power in military aviation. The first essential of this position, he added, was pre-eminence in scientific research, with, otherwise, the risk of utter destruction. General Arnold made his statements in testimony before the joint Senate committee which is holding hearings on the proposed National Research Foundation.

Federal aid for post-war scientific research and development in all fields was approved also by Harold L. Ickes, Secretary of the Interior; former Representative Maury Maverick and Bruce K. Brown, a vice president of the Standard Oil Company of Indiana.

"The range, speed and destructive capacity of a powerful air force now is such that any aggressor by sudden action could disrupt and even obliterate the life of an attacked nation," General Arnold said, "and we must anticipate that it will be with this weapon, vastly improved, with which future aggressors will strike first."

"Must Stop It Before It Strikes"

"Also, that the United States, which has twice been the determining factor in the defense of civilization, will be his first target. Against such aggression we must recognize that the only certain protection is the ability to meet and overcome it before the first blow is struck; and for the comprehensive research essential to such preparedness, the imagination and inventive genius of our people in industry, scientific laboratories, universities and our armed services must have free play, incentive and every encouragement."

Against the atom bomb, as such, however, no defense was possible other than by "shooting down" the attacking carrier, and in the "next war" that counter-measure would be of no avail because "they won't come by aircraft," General Arnold said.

"The only defense then will be to stop it before it starts," he told the committee, "because they will come in the form of guided missiles, launched from planes beyond the range of aircraft installations, and impossible of interception or destruction as they approach their destination."

Asked by Senator Magnuson how, if at all, in his opinion such future attacks could be forestalled, General Arnold replied that his own belief was that the only "real defense" would be the creation of a "highly-trained and modernly-equipped force the sole purpose of which would be to prevent war by maintaining peace."

Watch on World Proposed

"Such a force would include a highly-trained intelligence service, to know what goes on, to detect and report developing aggressive tendencies on the part of any nation," he explained, "and a highly-trained and equipped military force, the most powerful striking force imaginable, ready at all times to move in and stop any nation planning aggression before he can begin to carry out the thought."

On the Record

By Dorothy Thompson

The Atomic Bomb—of Anarchy NYP 10/19

There is a somewhat ridiculous hysteria going on, obscuring quiet intelligence. It arises from a combination of pessimism and utopianism. We are told, in short, that either we shall have a world super-state or World War III. Obviously, World War III is to be between the Anglo-American world and the Soviet Union.

Mrs. Roosevelt said the other day that, if we didn't get on with other nations, the first atomic bomb in the next war would fall on the United States. Why, necessarily?



Numerous confidential conferences are going on. One last

month at the University of Chicago participated in by atomic scientists and politicians, apparently resulted in the either-or outlook. Another in Dublin, N. H., terminated this week in the same way. And the game of atom, atom, who's got the atom, goes on interminably.

Everybody can, or will, have the great secret. But why must we assume that it will be used to start another war.

The truth is, I think, that no government in the world will dare, in any near future, to start a war, because of a factor not counted by the scientists or politicians: The people.

Even with atomic bombs you cannot win a war without disciplined, enthusiastic armies. Armies are composed of men. And men, nowhere in the world, are willing to fight another war in this generation.

Overreaching Themselves

At present the victorious nations are overreaching themselves and are thereby bringing about a condition of appalling chaos in the countries which they occupy. This chaos inevitably ricochets upon themselves.

The Russian situation is neither enviable nor strong. It deteriorates daily, as even the meager reports show. The Russian armies, after three and a half years of most brutal and cruel warfare, are out of hand in the territories they occupy, and such Russian officers as are not also out of hand are in despair.

To compensate for their sufferings Russian soldiers have been encouraged to loot as a policy. They rape without a policy. All armies loot and rape; but a strong discipline keeps this horrid accompaniment and aftermath of war within some bounds. When discipline breaks down, armies cease to be armies and become bands. But bands are most unreliable as instruments of a state in war.

A policy of unrestricted revenge breaks down the morale of the victors. It is a disintegrating factor. If you sow to the wind you reap the whirlwind—in the 20th century as in Biblical times.

This is obvious in Eastern Europe, and its limits are not yet set.

Where There Is Chaos

The Russian-sponsored governments of Poland, Jugoslavia, and Hungary, have no real popular support, and therefore have no authority. Where there is no authority there is chaos.

The Polish government has nothing to offer the people, except a pot. It has no disciplined patriotic forces on which to rely. The day is coming, if it is not now here, when Stalin will wish he had General Anders in Poland. The Beirut government, unable to bring a semblance of order into Poland proper, has turned loose huge bands of marauders into Germany and even into Czechoslovakia. These marauders are making any sort of orderly Russian occupation impossible. Reports from Eastern Germany

reveal that Russian officers are trying to protect the German population, simply for purposes of discipline, for the example of the Poles has a disintegrating effect upon Russian Army morale.

Eisenhower 'Desperate'

Meanwhile, in Berlin, Gen. Eisenhower is obviously desperate. "Germany," he says, "is on the verge of economic disaster because of an 'explosive' inflationary condition; the German government is dominated by native Communists who have no popular support.

"Desperate conditions below subsistence level are indicated." What threatens, it is clear, is not "revolution," but anarchy, the offspring of starvation without hope.

Stalin's Headache

But anarchy on the Russian frontiers, with the participation of Russian troops, bodes ill for so highly disciplined a regime as the Soviet. Generalissimo Stalin must have severe headaches.

It bodes ill, also for the morale of the other Allied armies. The Potsdam measures will, of course, increase it. If de-industrialization is ruthlessly carried out in the West as well as the East, homeless, foodless, workless hordes—without even the discipline of daily work—will surround the American, British and French occupation forces. These forces are composed of human beings—a fact constantly overlooked—and the result will not be favorable to orderly occupation or military morale.

Total Anarchy

What we have to fear, therefore, is not war, but the collapse of large parts of the world into total anarchy, with all its concomitants of lawlessness, banditry, and crime.

Needed is a thorough revision of occupation and political policy—it is no less in the Russian interest to revise it than in our own. We cannot get world organization out of anarchy. We must take thought now of the immediate necessities of policy, rather than of the ultimate use of the atomic bomb. For there is more than one way in which the world can blow up.

The mob is a human variety of nuclear disintegration.

World Government Proposal Is Traced to 'Atomic Jitters'

Dublin, N. H., Group's Plan to Scrap the Present Security Organization Is Called an Effort to Do Things the Easy Way, and Thus to Fail

By Major George Fielding Eliot

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There is a new disease which seems to be sweeping the country. For lack of a better name, we might call it "atomic jitters." It isn't going to help us solve our problems. The atomic bomb is a revolutionary discovery. The problems

which it presents to us can be solved only by cool and careful thinking and planning. It took years of hard work to produce the bomb. It will take years of hard work to find methods by which it may be controlled, by which atomic energy may be made to serve mankind and prevented from destroying him.

Hasty action will only complicate our difficulties.

Up at Dublin, N. H., a group of distinguished Americans met a few days ago and, after listening to scientific prophecies of what might happen to us, came to the astonishing conclusion that we should throw away our present international security organization and, instead, demand a world federation, a world government.

Slow Progress at San Francisco

To this writer's mind, that sort of thing is sheer panic, supported by very little common sense. To any one who was present at San Francisco, and knows the infinite patience and pains that were necessary to get agreement on every single phrase, almost on every word, of the United Nations Charter, it should seem fantastic to suppose that the same nations could now be brought to agree on a far more drastic sacrifice of sovereignty than was ever contemplated at San Francisco. To suggest such a step before any of the agencies created by the Charter have even begun to function, before they have had any sort of try-out, would merely be to weaken public confidence in the United Nations Organization at the very moment when it needs the maximum of confidence and support from all the peoples of the world. To go no farther than our own country—just ask your Congressman what chance a proposal for a world government would have, right now, if presented to the Congress of the United States.

The job is not to make something new and wonderful. The job is to make the international security organization which we already have, to which we and thirty other nations are already pledged, do the work for which it was designed.

I once heard a certain general highly praised by his superior. "He doesn't waste time telling me that he can't accomplish his mission unless I give him such-and-such," said the superior. "He gets the job done with what he has. He makes do."

There are certain things we can do now with what we have. There are certain things we should not try to do until we have facts on which we can base intelligent decisions. We have two basic problems: To establish a workable sys-

tem of world security, and to survive while we are doing it.

A sensible security program might include these steps:

1. Get the various agencies and organisms of the United Nations Organization operating as soon as possible. Within that framework, begin (as the first order of business) discussion of a general agreement on limitation of armaments, with special reference to atomic weapons, rockets, guided missiles and other things of that general type, and a provision for the Security Council to have the right to make inspections anywhere, any time, without any one being able to veto such action.

2. Meanwhile come to a decision as to the domestic control of atomic energy, and talk the whole subject over with our present atomic partners, Britain and Canada, in the hope of reaching a common viewpoint.

3. Postpone all legislation on the reorganization of our armed forces until we know where we stand in the international field, and use the time interval for a comprehensive, impartial survey of our military policy by a commission of top-flight civilians. This is necessary anyway in order to avoid piecemeal decisions.

A National Policy Council

4. Set up a national policy council at the highest level (President, Secretaries of State, War and Navy, plus some form of Congressional participation in making policy), with a permanent secretariat and with responsibilities established by law for keeping our foreign and military policies in true balance.

5. Create a first-class national intelligence service, reporting directly to the President and the policy council. We must have accurate and timely information of what goes on in this troubled world. Facts are the only basis for wise decisions.

6. While we are working out these problems, let us keep in hand sufficient margins of military and naval power, supported by industrial organization and by scientific research, so that any breach of our peace will appear suicidal to potential enemies.

These are not spectacular or dramatic suggestions. They will hardly be satisfactory to those who want the whole problem of security to be solved by tomorrow morning. But they form a connected program which seeks to make the best use of what we have, while trying to find out how we may progress to better things. The lessons of history suggest that human beings will make durable progress forward and upward in the future, as in the past, only in one way: step by painful step.

Congress Waking Up to Importance of Atomic Issue

Scientists Before House Group Split on Johnson-May Bill

By ELIZABETH DONAHUE
Washington Bureau

WASHINGTON, Oct. 19.—As the foremost atomic scientists of the Nation swarm through the committee rooms and corridors of the Capitol, pleading for international control of the atom's terrible power, key Congressmen are slowly awakening to the knowledge they are juggling the future of civilization in the Johnson-May bomb control bill.

Although even the scientists are divided regarding the revolutionary measure, giving a nine-man commission the greatest authority ever granted in time of war or peace, they have brought into the open vital domestic and foreign issues which the War Dept. and some Congressmen had elected to keep from the American people.

The House Military Affairs Committee, which a week ago was devoting its discussions to whether President Truman should be permitted to give the "secret" of the bomb, showed a new awareness that the "secret," if any, can be a secret for a few years at most; that any domestic controls are stop-gaps and that in international agreements for atomic controls lie the last hope of civilization.



Dr. Oppenheimer

Three Testify

The three most important men given a full hearing by the Committee were Dr. J. R. Oppenheimer, who headed the atomic bomb assembly project in New Mexico; Dr. Leo Szilard, of the University of Chicago, and Dr. Arthur H. Compton, chancellor of Washington University in St. Louis.

Strongly hinting that the philosophy of the authors of the Johnson-May bill is directed toward an international armament race, Szilard told the Committee that "some people seem to think we should make atomic bombs to blast the hell out of Russia before they blast the hell out of us."

Szilard disclosed that scientists throughout the war were compelled to violate War Dept. security regulations and interchange information in order to make the atomic bomb.

Free From Criticism

"Now," he added, "under this commission no one in the U. S. will be able to criticize its members from the inside free from the fear of going to jail."

"No one can criticize them from the outside," he added, "because they will have no information."

Presenting a different view of the commission setup, Oppenheimer told the Committee there are two reasons for quick passage of the Johnson-May bill as it stands:

¶ "All information related to responsible for determining who

should use atomic energy and how it should be used."

¶ "It is our profound belief that the ultimate hope of the future rests in international controls and I am convinced the people most concerned with this want to enter negotiations with a definite domestic set-up."

"I have confidence that this Nation," he said, "will find nine conscientious men to carry out these policies."

On Wednesday Dr. Oppenheimer appeared before the Kilgore subcommittee of the Senate Military Committee, which is considering a bill for a Federal agency to aid scientific research. The House Committee, before which he appeared yesterday, is considering the Johnson-May Bill to set up a commission to control of future atomic development domestically.

Oppenheimer expressed no opinion as to whether dollar-a-year-men employed part time could do atomic energy and all control of its use now rests with the War Dept. and is wrapped in secrecy. The War Dept. should not be the job. Szilard told the Commit-

5-Year Plan

By United Press

LONDON, Oct. 19.—Sweden has cancelled military defense plans for the next five years as result of American use of the atomic bomb in Japan, says Radio Stockholm.

Future possible uses of atomic energy led to the government's decision, Stockholm said. Scientists of the Swedish Research Institute were instructed to investigate the subject after the atomic bomb attacks on Hiroshima and Nagasaki.

tee, however, "If anyone can find the man who can work all day and do this job at night and give up food and sleep, I would like to find him."

Szilard's position that the War Dept. should retain interim control of the scientists and the science of the atom, he said, was based on fears that the Johnson-May bill would create a permanent military dictatorship.

Dr. Compton requested that the committee water-down the penalty provisions of the bill to encourage scientific research. He said, "The need for some control is clear and obvious," and added:

"The only really successful form of control lies, however, in the hands of international organization empowered to inspect the manufacture of atomic weapons and to insure that nations who have them will never use them."

Troublesome Atom

The men who developed the atomic bomb last week told Congress what they believed should be done with it. The occasion was the House Military Affairs Committee hearings on a bill introduced by Representative Andrew May with Administration backing. The bill would grant sweeping powers to a nine-man Atomic Energy Commission and would restrict all private scientific research and manufacture of anything relating to atomic energy to those persons and companies licensed by the commission. The scientists led by Dr. Harold Urey, Nobel prize winner and leader in atomic research, put greatest emphasis on the international aspects of the problem, though the bill is concerned with the domestic aspects.

Dr. Urey asserted with the approval of his colleagues that the bill would "create a potential dictator of science" and would "serve notice upon the world that we were opening an armament race." Following the same line, Dr. H. J. Curtis said: "The whole tone of the bill is such that if I were a scientist in some other country I assuredly would say to myself: 'Those fellows over in the States are getting ready to bomb us in a big way.'"

Dr. Leo Szilard said he believed the feeling behind the bill was "to make atomic bombs and blast hell out of Russia before Russia blasts hell out of us." Dr. J. R. Oppenheimer contended that the formula was never a secret and "cannot be either kept or given away. If we attempt to retain what we know,

other nations will say 'We will do it without you.'" Dr. H. L. Anderson declared that the measure would greatly impede any effort to create international control of the atomic bomb. "If we are to exist at all," he added, "the only solution is some kind of international peace arrangement based on mutual trust. This bill seeks to cloak what might be a great military preparation."

In Congress sentiment has run against sharing the atomic bomb "secret"; there were signs of fear that other nations—specifically Russia—could not be trusted with the formula. The United States, argued many Congressmen, must not reveal its industrial "know how" until the rest of the world is "as anxious for peace as we are."

Topics of The Times

NYT 10/21
Don't scoff at science because scientists are disagreeing in Washington today in the hearings on the atomic research bill. They are disagreeing in their capacity as individuals and citizens, and not as scientists.

When the Allied Chiefs of Staff in the late war were planning the dispatch of trucks and jeeps to Soviet Russia, they could have learned much by consulting Charles Kettering and Henry Ford. But if Messrs. Kettering and Ford had taken it on themselves to insist that the war could be won more quickly by sending all the trucks and jeeps to North Africa or to the Pacific the two experts would have been talking out of order. As intelligent men and good Americans they were entitled to their own views on over-all strategy and policy; but carrying no more authority than any other intelligent private citizen. As for a sharp difference of opinion between Ford and Kettering on the rival merits of the Tigers and the Cubs in the late world series, the names would carry very little prestige.

Fields of Competence
Prof. Harold Urey of Columbia University, a leader in the atomic bomb research, gave his views to the reporters in Washington the other day. He spoke for himself and three associates in that enterprise who felt as he does about the proposed legislation. He said, in the words of our Washington correspondent, that the May-Johnson bill would (1) "create a potential dictator of science" and (2) would have the effect of "serving notice upon the world that we were opening an armaments race."

To this the plain unscientific citizen might reply that in respect to (1), the menace of a scientific dictatorship, Professor Urey's opinion must receive our serious attention. His opinion on (2), the effect of the atomic bill on world sentiment, will be a personal opinion; it gains nothing from the fact that Professor Urey is one of the world's most eminent physicists.

And if Professor Urey were to tell the reporters that two weeks hence Columbia will beat Cornell by a margin of two touchdowns a good many headlines would likely say "Scientist Boosts Little Team," but the scientist part of the statement wouldn't mean a thing. If anything, it would strongly imply a rather unscientific bit of sentiment in an eminent scientist.

We have been speaking in general terms. Actually the situation, like all human problems, has its shades and gradations. For instance, it is by no means true that even in the field of science the scientists will always agree. One is tempted to draw up a little chart or table on the subject, though with no attempt at the precision of the navigator's chart or the atomic table. At the top of the sheet of paper we state the problem: "When and how much shall we defer to the opinion of Prof. Harold Urey, Prof. J. Robert Oppenheimer, Dr. Irving Langmuir and Dr. A. H. Compton, when they speak about the atomic bomb?"

The answer then would be as follows:
What to Believe
When Professor Urey tells you something about the nature of the atomic bomb and the methods by which the bomb was created (if he only would!), agree with him 100 per cent. On that subject Professor Urey and all the others must be as one.

When Professor Oppenheimer expresses an opinion about the effect of the May-Johnson bill on the freedom and progress of scientific research, listen to him with great respect; because he is speaking about science, which is his domain. At the same time check his opinion by that of other scientists. There is a very sharp difference of opinion on the subject.

Quiz Moves On
When, or if, Dr. Compton gives his opinion on how soon we may expect atomic energy to be adapted to industrial uses, listen to him seriously, but check by other scientific estimates. Respectable predictions have ranged from ten years to fifty years; and now and then one hears it suggested that it will be a very, very long time indeed.

Finally, when a distinguished scientist tells you that the May-Johnson bill will vastly improve our relations with Soviet Russia, or on the contrary will greatly prejudice Russo-American understanding, you are at liberty to take his opinion for what you think it is worth. When it comes to speaking of how best to make Russia behave, by scaring her or by winning her friendship, an atomic scientist carries no more authority than a non-atomic intelligent doctor or lawyer or carpenter.

Forerunner Bomb's
Not even the fact that a scientist has had a share in making the atomic bomb qualifies him to map national policy or read the future. In a few months it will be fifty years since the death of Alfred Nobel, who founded the Peace Prize, along with the other prizes. He was the inventor of dynamite and smokeless powder. He obviously was a better inventor of high explosives than he was an interpreter of the course of history in the two generations after him.

Offhand one is tempted to say that the worst judges of human behavior would be the scientists. Every generation they revolutionize their science, but the human heart is a pretty consistent performer.

NY CHALLENGE OF THE BOMB 10/21

In his testimony before a Senate subcommittee Rear Admiral Purnell made the only possible case for keeping the atomic bomb to ourselves, yet he could say no more than that this country alone is industrially able at present to prepare bomb material and that though the theory of atom-splitting is no secret the making of the bomb is. The history of technology indicates plainly enough that once an idea is in the air half a dozen inventors come forward with ways of carrying it out. Professor William F. Ogburn has compiled a list of no fewer than 148 major inventions and discoveries which were made simultaneously and independently. We may be sure that technical history will repeat itself in the case of the bomb.

As matters stand, the opinions of the scientists and of the military authorities clash, with the military authorities in the ascendant at the moment. For the scientists it must be said that they alone have faced the puzzle of the bomb socially and realistically. They are for international control. Professor Arthur H. Compton, our most distinguished physicist, believes that it is essential to establish power to control the atomic bomb and other major weapons and to maintain world inspection and police forces. In a statement published here and abroad Nobel laureate Niels Bohr, whose advice was sought in developing the bomb, speaks of civilization's "most serious challenge," and advocates "international control of every undertaking which might constitute a danger to world security." In Great Britain similar arguments have been advanced by Lord Darnley, Lord Addison and Lord Cherwell.

For the immediate future much depends on the fate of the May-Johnson bill, which will soon be debated in Congress and which calls for enforced secrecy of a kind repugnant to science. If Congress decides to class the bomb with other military weapons and keep it secret until some international agreement is reached, but declines to muzzle physicists who make new discoveries in the release of atomic energy, it will merely follow a policy which has been traditional in every country and leave the door open for much-needed further discussion with other Powers for the purpose of developing some effective form of international control.

WT 10/20 Test-Tube Supermen for Atom Age?

By DEAN W. DITTMER,
United Press Staff Correspondent.
WASHINGTON, Oct. 20.—A new suggestion to Congress on control of atomic energy would put it in the hands of a super-race of United Nations' geniuses of carefully selected test-tube parentage. The suggestion was sent anonymously to the House Military Affairs Committee. According to its proponent it also has gone to President Truman, a number of Senators, former Montana Rep. Jeanette Rankin and Dean Virginia Gildersleeve of Barnard College.

The proponent of the idea asserts his or her only idea is to get the best brains possible as guardians of the atomic bomb.

The idea would be to have eugenics experts of the United Nations select a list of the most intelligent, best qualified United Nations leaders for fathers-to-be.

A comparable list of mothers-to-be would be selected from "women of finest eugenic value—heredity, health, college education" or "leaders in achievement."

The proposal—which Military Affairs Committee members have not responded to very enthusiastically—would provide for voluntary participation, with the mothers-to-be having opportunity to "designate donors preferred" from the lists prepared by the eugenics experts.

If the father was a citizen of one country and the mother a citizen of another, the progeny would represent both countries on the United Nations staff and his filialty would be to the United Nations.

Education of the child geniuses would be provided in the world's best schools—one year in each country.

The proponent suggests that the mothers travel with the children. He points out "single women would be freer to travel with children for world education."

When a mother is unable to travel, the proposal suggests chaperonage of the children by women's organizations and adds that such a service "might be undertaken by a Catholic convent."

To avoid embarrassment to single mothers, the proposal would give women service titles instead of calling them Miss.

The proponent of this scheme calls it "atomic bomb guardians-to-be."

He does not suggest what controls should be put on the development of atomic energy, either domestically or internationally, between now and the time the superchildren would be old enough to take the reins.

How Far Has USSR Gone Technologically on Atom Bomb?

By ALEXANDER KENDRICK
(Copyright, 1945, by Chicago Sun and
The Newspaper PM, Inc.)

WASHINGTON, Oct. 22.—Behind all the testimony and talk about the atomic bomb during the last Congressional fortnight looms the intriguing and as yet unanswered question: does Soviet Russia know the secret?

Most of the Senators and others who have been vociferously insisting that our "know-how" must never be shared with anyone else are acting on the assumption that Russia doesn't know how to make the bomb. Obviously, they would reverse themselves in a minute and come out for complete internationalization, if they thought Russia did have the bomb.

For the benefit of Senators who might not have been impressed by scientific opinion that the bomb secret could be exclusive at best for a few years, the following notes on Soviet science and atomic theory are set down.

They are the notes of a reporter who was in the Soviet Union last year, and who has tried to keep up with Soviet scientific literature since.

They may help fill the obvious gap in all the current books and pamphlets dealing with the atom bomb.

Peter Kapitza, the Soviet Union's leading nuclear physicist, was interviewed by American correspondents in Moscow last year when he received the medal of Philadelphia Franklin Institute.

At that time he told us that the Soviet Union was concentrating on three all-important fields of physics—atomic energy, low temperatures and absolute-zero experimentation, and the problems of solid bodies, such as hardness and strength of matter. The last mentioned is a subordinate phrase of atomic research.

Kapitza, 51-year-old tweedy, pipe-smoking physicist, is the head

of Moscow's famous institute for physical problems, which was established for the use of himself and his staff. Kapitza came from England back to his native Russia to assume the directorship.

From what he told us, it was obvious that he felt that in no other country could he have his own laboratory devoted to scientific research.

Kapitza was the favorite student of the late Lord Rutherford, the pioneer and fountainhead of the world's atomic research. A fellow student at the famed Cavendish laboratory in Cambridge was Niels Bohr, the Dane now credited with the principal role in devising the theory of the atomic bomb. The two men are friends.

In 1934, Bohr visited the Soviet Union and inspected and spoke at what were then the two principal centers of scientific research, the Physico-Technical Institute at Leningrad and the Physico-Technical

Institute of the Ukraine at Kharkov. Kapitza's institute at Moscow was evacuated to Kazan during the war, which means that whatever research went on there was outside the ken not only of European and American scientists, but even the Soviet scientists remaining in Moscow and Leningrad.

During the war, while busy with atomic research, Kapitza also devised a method for making cheap oxygen in large amounts by liquefying air. This was done for the Soviet steel industry, which can make steel in oxygen blasts at insignificant cost. He has also discovered a method of making liquid helium in large amounts.

That Kapitza is an international figure in physics is recognized by his colleagues in all lands. Just before the war he was one of the two editors of the famous international series of monographs on physics which included works on the atom, citing Enrico Fermi and

Bohr, the two key men of the atom bomb.

Kapitza is only one of several famous atomic physicists in the Soviet Union whose brilliant work in the field was well-known until the war drew a curtain over it.

They include the 35-year-old Armenian genius, A. I. Alikhanov, the almost as young Ivan Kurtchatov of Leningrad and the veteran of cosmic ray research, Daniel Skobel'tzyn, as well as the former director of the Kharkov Institute, Alexei Leipunsky.

Soviet scientists have been studying atomic theory since the Leningrad Institute was established in September, 1918.

The Soviet Assn. of Physicists has a special subcommittee on atomic theory, which co-ordinates all Soviet research on this question and prevents overlapping.

Kurtchatov smashed the atom at Leningrad just after Lawrence did at Berkeley.

AIR POWER IS URGED ABOVE ATOM BOMBS

Nuclear Force Is Part of Air Defense, Not a Substitute, Says Planning Report

Special to THE NEW YORK TIMES.
WASHINGTON, Oct. 21.—Air power, as the most effective instrument for maintaining world peace, should be used by the United States either as part of an international organization or independently, if necessary, to assure national security, the National Planning Association stated in a report issued today. The atomic bomb, it said, was an instrument of air power, not a substitute for it.

Development of civilian flying is such an essential element of national interest, according to the report, that the Civil Aeronautics Administration should provide college-age youth with a civilian pilot training program.

A comprehensive study of post-war military and commercial aviation was included in the report, which was submitted by the chairman of the association's advisory committee on the aircraft industry, William A. M. Burden, who is assistant Secretary of Commerce for Air. H. Christian Sonne, chairman of the National Planning Association's board of trustees, said the report was of a preliminary nature and that no action would be taken until all details were elaborated in a final report.

The association felt, however, that the interim report should be made public now because of the re-conversion problems which the aviation industry was facing.

No More Geographic Isolation

In urging the maintenance of strong military and commercial aviation establishments as a primary means of securing peace, the report stated that "the threat of stratospheric envelopment makes it impossible any longer to base national security upon geographic isolation."

"Wartime developments in electronics (radar), jet and rocket propulsion, air foil design for supersonic speeds, and nuclear physics all have direct application to aeronautics; that is, to airplanes and to self-propelled and guided missiles," Mr. Burden said. "Defense against such weapons requires aircraft and guided missiles, capable of fantastic speeds, which will be able to find, intercept and destroy the opposing weapons in the air and at their launching bases."

"The Army and Navy air forces and the aircraft industry share the responsibility for the development of offensive and defensive guided missiles launched or dropped from aircraft or supported in flight by aerodynamic principles."

The regulation of common carriers by air, said the report, should be controlled entirely by the Federal Government, without State efforts to segregate intra-State aspects of the industry for purposes of safety or economic regulation. Double taxation of air transportation by the States should also be avoided, Mr. Burden asserted.

For Non-Premium Air Mail

As a stimulus to maximum development and use of air transportation, Mr. Burden recommended that first-class mail be carried by air without extra charge, where air transport would expedite delivery. He said also that air parcel post should be started at rates "having a proper relation to the ton-mile cost of the transportation."

Mr. Burden advocated that, in the field of international air transportation, the principle of regulated competition between several American air carriers should be adopted wherever it was economically feasible. To promote American aviation abroad he urged the following measures:

"1. Liberal policies with respect to licensing, for export and for manufacture abroad, of our latest and best designs, to the extent consistent with national security.

"2. Effective cooperation of military, commercial and civil air attachés of our Government abroad in prompt reporting of information with respect to aviation in foreign countries, as well as in the furtherance of our own aviation.

"3. Technical assistance to friendly foreign countries, especially by making aeronautical training in this country available to nationals of other countries. The cost of such training should be borne partly by the foreign Government and partly by our Government."

To promote aeronautical progress, Mr. Burden urged passage of legislation to set up a government supported national research foundation.

ATOMIC BOMB BAN URGED BY DR. UREY

Scientist Calls for a World Government Able to Prevent Manufacture of Weapons

Only by abolishing the atomic bomb and preventing its manufacture can the peoples of the world escape an atomic bomb war that could destroy the principal cities of the world and kill their inhabitants, Prof. Harold C. Urey, one of the Columbia University scientists who helped to develop the bomb, declared yesterday.

If one country has atomic bombs all industrial countries will soon produce them under compulsion of fear, and some could have them in sufficient quantity for a full-scale war possibly in five years, he asserted. Dr. Urey, who won the Nobel prize in chemistry in 1934 for his discovery of heavy hydrogen and who is now connected with the Institute of Nuclear Studies, University of Chicago, was the principal speaker at a luncheon of the American-Scandinavian Foundation marking the anniversary of the birthday of Alfred Nobel, Swedish inventor and donor of the Nobel prizes. Six other Nobel prize winners were among the 500 attending the affair at the Waldorf-Astoria Hotel.

Oppose Johnson-May Bill

With only five years before they will face the "dreadful threat" of atomic bombs in the hands of other countries, the people of the United States must decide quickly what to do with their secret, the scientist said. He assailed the Administration bill introduced in Congress by Senator Edwin C. Johnson and Representative Andrew J. May proposing control of atomic energy through a Presidential commission as leading to an atomic bomb race.

Dr. Urey, describing the atomic bomb as so devastating it will encourage future aggressors "to attempt the conquest of the world in a few days," called for a world government possessing adequate power to maintain peace, with inspection service to detect and report attempts to manufacture atomic bombs and other heavy arms, and with various divisions of the world relatively unarmed, as the only way to peace.

He said such a solution would not be easily arrived at, adding that "I am not even so sanguine as to think that there is a high probability that logical action of this kind can be accomplished without the dubious advantage of a third World War"—but he said he was willing to trust the decisions of an informed populace of the United States.

"After all, it is the people of the United States who face destruction and death, and they should have the privilege of making their own decisions," he said.

His Propositions Summarized

Dr. Urey made four statements that he said he would "categorically defend":

1. If atomic bombs are made in one country they will be made in all industrial countries of the world.

2. If atomic bombs are made in all these countries we will spend all our days in deadly fear that they will be used, and in time they undoubtedly will be.

3. By one means or another no atomic bombs must be made anywhere in the world, and they must not be in the possession of any government of any kind.

4. The peacetime applications of atomic energy, or, in fact, of anything else are of no importance unless the danger of atomic bombs is banished from the earth.

Pointing out that no complete defense had yet been developed against the machine gun, submarine and airplane and other modern

weapons of war, Dr. Urey said no decisive defense against the atomic bomb could be expected.

Declaring it is not unreasonable to assume that "with sufficient effort 10,000 bombs" could be produced, Dr. Urey pointed out that 1,000 bombs of the present kind, if properly placed, would devastate 10,000 square miles. "One thousand bombs, if properly placed, would destroy thirty-three cities of the size of New York," he added.

Herman Eriksson, Minister of Sweden to the United States, making his first public appearance in this country, said in a brief address that freedom of action was essential to scientists, writers and workers for the cause of peace.

Prof. Reuben Gilbert Gustavson, vice president of the University of Chicago, told of the need for cooperation between scientists of all countries for scientific progress.

Prof. Kenneth Ballard Murdock of Harvard University, who has been appointed by the foundation as American exchange professor to Scandinavian universities in April and May, 1946, said the American tradition must be construed as a stimulus to improvement of American life.

Henry Goddard Leach, president of the foundation, and Hans Christian C. Sonne acted as chairmen.

Atom Bomb and Politics

Despite Our New 'Bargaining' Power,
Peace Is Seen as a Still Far-Off Goal

By HANSON W. BALDWIN

Eleven weeks have passed since the first atomic bomb in world history was dropped on Hiroshima, Japan.

They have been weeks in which the history of tomorrow has been shaped to the dangerous pattern of today; they have been weeks in which the world has made little progress toward either international security or international morality. They have been weeks of confusion and divided counsel, of lack of leadership, of claims and contradictions—and all the while the atomic bomb has clouded the skies of tomorrow.

In those weeks so many contradictory statements have been made about the atomic bomb—and incidentally about the technological revolution in war, of which the atomic bomb is only a part—that it is necessary to clear away some of the trees before we can see the woods.

First, in the field of atomic developments and manufacture:

Our monopoly of the "secret" of the atomic bomb is not a laboratory monopoly, not a monopoly in the field of physics. As Dr. J. Robert Oppenheimer has put it, "You cannot keep the nature of the world a secret; you cannot keep atoms secret." The data essential for atomic fission are known to all nations; indeed, our own nation did not originally lead in the laboratory and development race. We were able to manufacture the atomic bomb first, and we hold a head-start now, because of this country's unequaled industrial facilities, engineering and production "know-how" and power capacity. That is the real "secret" of the atomic bomb—America's engineering-industrial capacity.

Russia a Potential Producer

The present known methods of manufacturing the bomb require an industrial "know-how" so versatile, power resources so tremendous and an investment of plant and capital so great that it is probable that today only the United States is capable of manufacturing the atomic bomb. Until the processes are simplified, which they will be, not even Great Britain (which probably does not know the full secret of manufacture and detonation) has the capacity or the industrial economy to manufacture the bomb. Russia probably is the only other nation in the world, besides the United States, with sufficient potential to make the bomb by the processes now known. Russia must still develop that potential into actual manufacturing capacity. How long that will take no one knows, but it seems probable that non-Soviet physicists have misappreciated the engineering problems involved and the present stage of development of Russian industry. But in any case, within two to fifteen years, conceivably less, im- probably more, at least Russia, and quite possibly other powers, will be able to manufacture atomic bombs.

And they will have the raw material resources necessary to do it. At present uranium and thorium are the only practicable "atomic-

bomb" elements; in time, the energy in other elements will be tapped. Deposits of pitchblende or carnotite, from which uranium is derived, are known to exist in Canada, the United States, the Belgian Congo and Europe. At least one of the European sources is within the Russian sphere of influence, and there are believed to be sizable sources, unknown to us, in the Soviet Union.

Our own progress in atomic physics and engineering will not halt, but whether we can maintain our present lead and advance more rapidly than Russia is uncertain. Our best physicists and engineers are going back to civilian laboratories. Dr. Oppenheimer and others like him will be leaving the Government atomic bomb project early next year. The Russians, on the other hand, operating under a totalitarian system, will be able to concentrate just as much energy and capacity as they wish upon their project.

Other Nations Will Learn

It is at present unlikely, but not impossible, that the Soviet Union, even without any help from us, will in time overtake our lead. In any case, in some years—before our children are fully grown—Russia will have atomic bombs of her own whether we give her the manufacturing "secret" or not, and, when manufacturing processes are simplified, other nations will also be able to make them.

Second, in the political field:

The atomic bomb, it has been said, is giving us a great though admittedly a temporary advantage in our political negotiations with Russia and in settling the problems of the peace.

The past eleven weeks belie this statement. The problems of the peace are at stalemate. Moreover, the atomic bomb is of relatively little use to us in political bargaining, for the Russians are realists; they know we would not use the atomic bomb against them unless they used it first, or unless they attacked us suddenly and brutally by other means. In other words, in so far as the atomic bomb is concerned we are not holding an ace; we are bluffing. Moreover, if Russia should say in a year or so, or even tomorrow, "We have made an atomic bomb"—the United States, given its present intelligence service, would not know whether the claim was true or not. Furthermore, put ourselves in the Russian position. If the Russians possessed the bomb and we did not, would we consider its possession conducive to peace; would we be disturbed or placid?

Where, then, is the political advantage to us of the atomic bomb? It has given us no advantage so far; indeed, it seems to have forced thinking in Washington more strongly than ever before into the glib old pattern of dependence upon national power.

There are too little imagination and breadth of vision in the halls of Congress and the streets of America, and without them the people perish.



I'd Rather Be Right

By Samuel Grafton

NYP

10/22

NOTES ON THE ATOMIC BOMB: 1. The atomic bomb has distorted the yardsticks and rulers by which we used to gauge the old, familiar world; and the more we think about it in terms of the differences it has made, rather than in terms of its similarities to what we once knew, the safer we shall be. For one, the atomic bomb has not made us stronger; it has made us weaker; it goes a long way toward cancelling out the leadership in war-making power which our industrial might once gave us. A nation with small aviation-building facilities is admittedly weaker than a nation with large airplane plants; but a nation with a small atomic-bomb establishment cannot be said, in the same way, to be weaker than a nation with a great one.

A hundred atomic bombs are as good as a million, and thus it can be held that the unlocking of the energy in the tiny atom has done away with our comfortable old tape-measure rule that size means power. Our cozily arithmetical world has been wiped out by the mighty geometric progressions of chain-reaction. Dr. J. R. Oppenheimer, who directed the atomic project at Los Alamos, has testified that one atomic bomb raid on America could kill 40,000,000 persons; and in a world in which one equals oblivion, one plus one no longer equals two.

The Old Rules Go

2. The world cannot put the atomic bomb in its pocket, and hope to continue at even the present level of its dubious ability to keep the peace. We must go decisively forward, or crashingly backward; we cannot stay where we are, for a single outlaw nation, some Naziland of the future, will, with the atomic bomb, have a potential no outlaw nation has ever had before. So will any one party within a nation, or conceivably, an individual within a party.

Where power so decisive as that of atomic energy is involved, the old concept of punishment after the crime is no longer valid; for after crime on this scale there are no longer any courthouses, and our international penology begins to seem as old-fashioned as our arithmetic.

We Try Not to Look

3. The trouble with our legislative approach to the atomic bomb, as expressed in the May-Johnson bill, and in the manner of its handling, is that we are trying to gloss over the critical differences between the atomic bomb and earlier military weapons; and we are playing on the similarities. Thus we put atomic legislation in the hands of the House Military Affairs Committee, as if atomic energy were only a new military gadget; though the smashing of the atom, and the commencement of a new age deserve at least the respect of new committees, devoted to this subject alone.

4. And it is almost as if we did not want to be told about the differences the atomic bomb has made in our world, for we concoct the May-Johnson bill, without asking the advice of any of the scientists who were intimately concerned with developing the bomb; we try to jam it through committee in brief, closed hearings; and President Truman calls for speedy passage of the bill in a remarkable public utterance in which he confesses that he has not yet studied it thoroughly. It is as if, in a kind of flurry, we want to get the wretched thing stowed away in some sort of pocket, any sort of pocket, or commission, make it illegal to talk about it, and then go on about our business.

A Building Code for Pompeii

5. Our fault is that we are trying to find a nationalist way of handling a discovery which wipes out nationalism; in a very real sense, we are debating about what kind of sails ought to be put on steamships. The issue is not whether we ought to mail blue-prints of the bomb to every country on earth tomorrow morning; the issue is what steps are we taking to make this the kind of world of which the bomb can safely be a part? The answer is that we are not taking any such steps, but that we are using the bomb itself to try to perpetuate the kind of world which the discovery of the bomb has made impossible.

We are hanging on to the past with our fingernails and our teeth; we are filing an amendment to the building code of Pompeii, a city already lost.

Fulbright Asks United Nations Arms Control

Declares One-Night Attack by Atomic Bomb Could Paralyze Entire U. S.

The antiquated concept of the sovereignty of nations points the way to destruction by the atomic bomb, Senator William J. Fulbright, Democrat, of Arkansas, declared here yesterday.

"Like primitive man we are faced with elemental and infinite forces which we do not understand, forces which threaten to snuff out our lives," he told 2,000 persons at the twentieth anniversary conference of the United Palestine Appeal at the Commodore.

"The only solution I can conceive," he continued, "is the recognition by all nations that at last the time has arrived for us to delegate definite powers over armaments to the United Nations Organization."

Cites Warning of Scientists

Repeating the warnings of scientists that the bomb cannot long be kept secret, he said: "In an atmosphere of suspicion and secrecy each nation will inevitably suspect every other nation. Sooner or later some nation will no longer be able to endure the suspense of impending annihilation."

Senator Fulbright called the requirement of unanimity among the five big powers for action by the United Nations Organization another way of saying that we shall abide by the rules if they suit us.

"There is no law in the real sense between sovereign nations," the Senator declared. "It is fallacious to speak of outlawing any practice they may believe to their advantage to use." He added that the United Nations Organization should be able to bring its full power against nations that object to its armament verdicts.

Senator Fulbright said the United States could be paralyzed by the atomic bomb in one night of carefully planned attack on the twenty largest metropolitan areas, which contain 40,000,000 people. American reluctance to make war would probably prevent this nation from being the first to attack, he added.

Proposes British Yield Mandate

In discussing Jewish demands for admittance to Palestine, he suggested that the British give their mandate over the country to the United Nations Organization if they feared controversies with the Arabs opposing Jewish immigration.

The conference approved a resolution requesting President Truman to press his suggestion to the British government that 100,000 Jews be admitted immediately to Palestine. The resolution asked his help in securing transportation and funds for the immigrants, fulfillment of the Balfour Declaration and in the creation of an international agency to recover property expropriated from Europe's Jews.

Another resolution urged that the United Jewish Appeal of which the United Palestine Appeal is a member, launch a \$100,000,000 campaign at once for 1946. In messages, Governor Dewey called for the support of U. P. A. by all Americans and President Truman offered anniversary congratulations.

Speakers included Dorothy Thompson, newspaper columnist; Sir Simon Marks, British industrialist; Dr. Stephen S. Wise, chairman of the U. P. A. administrative committee; Dr. James G. Heller, national chairman of U. P. A.; Judge Morris Rothenberg, president of the Jewish National Fund, and Dr. Israel Goldstein, president of the Zionist Organization of America.

Senate Votes Special Atom Body Of 11 to Study Policy on New Force

Special to THE NEW YORK TIMES.

WASHINGTON, Oct. 22 — The Senate adopted today a resolution authorizing a special committee of eleven Senators to study the development, use and control of atomic energy after Senator Brien McMahon, Democrat, of Connecticut, the sponsor, had said that the atomic bomb was the most momentous development since the birth of Christ.

The resolution was adopted unanimously by a voice vote. Two roll-calls were necessary, however, before a quorum was present to vote on an amendment to the measure, a voice vote having left the issue in doubt. Two hours and fifty minutes was devoted to the debate, almost all of it to the question whether the committee should have nine members, as proposed by Mr. McMahon, or eighteen, as suggested in an amendment by Senator Joseph H. Ball, Republican, of Minnesota.

A compromise was reached on a committee of eleven, as proposed by the majority leader, Senator

Alben W. Barkley of Kentucky. It was on his amendment to increase the membership to eleven that the roll-call was taken. The amendment was adopted by 45 to 27.

The resolution authorized Senator Kenneth McKellar of Tennessee, who was presiding, to select the chairman of the committee, whose term was set at one year and two months, the tenure of the present Congress. Mr. McKellar said that he would name the chairman and the members within a few days.

The debate indicated that the members of the committee would probably be drawn from the Military, Naval Affairs and perhaps two or three other committees that had claimed that atomic power problems came within their spheres.

The proponents of a large committee—some Senators argued for

twenty-one members—asserted a need to get a cross-section of the entire Senate on so momentous a problem as atomic power. Mr. McMahon, backed by Senator Barkley, declared that a committee of nine could work more efficiently and speedily than a cumbersome one of eighteen or twenty-one members. They also said that secrecy would be better served with a smaller number.

Senator Wayne L. Morse, Republican, of Oregon, asserted that the problem of atomic power was the greatest Congress would have to face in the next 100 years but that national policy on methods of controlling it were stalemated. World-wide suspicion of the United States has been stirred up, he added, by the trend of American atomic power policy. He urged that the secret of the atomic bomb be given to the whole world "because it doesn't belong to America but to mankind."

Unless Congress and the Administration proceeded more speedily in working out a sound policy, Mr. Morse continued, history would record that the United States failed in 1945 and 1946 when the world was ready for international organization and peace. It was a delusion, he added, to think that science could be nationalized and held as a club over the rest of the world.

Mr. Morse advocated an eighteen-member committee.

Vandenberg Backs Smaller Group

Senator Arthur H. Vandenberg, Republican, of Michigan supported Mr. Barkley's advocacy of a nine-member committee. "What's everybody's business is nobody's business," he said. In a committee of eighteen, he added, there would be a scattering of responsibility.

Mr. Barkley, in urging adoption of the resolution as submitted, reminded his colleagues that he had

felt that the subject of atomic energy could have been handled by any of several standing committees. "In view of the way this matter has got snarled up in the Senate," however, he said that he had decided to vote for Mr. McMahon's resolution.

If the committee were to be enlarged to eighteen or twenty-one, he added, the problem might just as well be referred to a standing committee.

The minority leader, Senator Wallace H. White Jr. of Maine, joined the advocates of a small committee but Mr. Ball and Senator Edwin C. Johnson, Democrat, of Colorado, insisted on a larger body and finally Mr. Barkley made his compromise offer. Senator Ball tried to get agreement on an amendment for fifteen members but this was turned down.

Senator Johnson raised the question whether the chairman of the committee should not be selected under the traditional seniority rule instead of by selection by the President of the Senate, as proposed in the resolution.

Mr. McKellar declared that he would rather have the Senate elect a chairman then select one himself, but this issue did not come to a vote.

10/22 An Atomic Dictatorship

The May-Johnson bill for the control of the atomic bomb and nuclear research clearly demands much more careful consideration than it has yet received from the public, from Congress or from the President.

In an article elsewhere on this page Mr. Stephen White, of the staff of this newspaper, remarks that it is not difficult to imagine the Atomic Energy Commission, which the bill would create, "becoming ultimately more powerful than the government that brought it into being." This is no exaggeration. The nine members of the commission would be appointed for staggered terms and would be irremovable except by the President and by him only for inability, neglect, malfeasance or for reasons of "national interest." Nearly all the powers of the commission would actually be discharged by a peculiar official, called the administrator, who would be removable only by the commission, and thus largely beyond any control whatever.

To this agency and its administrator the bill gives a more sweeping grant of power than any known in our history. They are given "plenary supervision and control over all sources of atomic energy and over all matters concerned with research" in the subject. Their expenditures cannot be disallowed by the General Accounting Office; they may hire and fire without regard to civil service laws and make or modify contracts without regard to the law of contract. With approval of the President they may "utilize and direct the services" of officers of any governmental agencies. They need not publish their regulations if they consider publication "inconsistent" with security. They have virtually unlimited powers of condemnation not only over thorium and uranium sources but over any minerals, any real property, mines or facilities, any "technical information" and any patents or patent rights the acquisition of which they may deem essential to performance of their functions under the act.

They have power to conduct nuclear research as well as to license any conducted by others. This means that they could imprison the entire effort in this field within the bounds of a rigid government monopoly lacking adequate responsibility. They could fire any employee who objected to the way it was being conducted; they could secure a fine of \$100,000 or ten years' imprisonment for any who spoke out of turn (that is to say, who violated their "security" regulations) against the manner in which they were discharging their duties, and would in consequence possess an unparalleled power of censorship over general public discussion of their stewardship in this matter, a matter which is of such absolutely vital consequence to our future not only in war but in peace.

What is the background out of which this remarkable bill has come? When President Truman said that he would recommend action to Congress on control of atomic power, one naturally expected Congressional debate and thought on the subject. Actually, the May-Johnson bill was prepared in the War Department; introduced on the day of the President's Oct. 3 message, it received one five-hour hearing before the House Military Affairs Committee. As a result of protest, it has since received one other hearing, largely devoted to attempts to suppress criticism and railroad the measure through as quickly as possible. At least two of the scientific men prominently connected with the atom project, impressed by the great dangers of unregulated activity in the field, have supported the bill. A number of others, more impressed by the creative possibilities of free research and the dangers of the War Department's obscurantist, military approach to the whole matter, oppose it vigorously. They are having great difficulty in making themselves heard through the barriers of censorship and security already imposed by the military method.

This matter is of far too great importance in every respect to be decided by the War Department in a bill hastily smuggled through Congress without opportunity for public discussion or understanding. On the necessity for control all are agreed. On the necessity for control of this sweeping and revolutionary character, with its ominous implications for foreign policy and its threat to attempt the impossible and disastrous

aim of putting scientific knowledge into a straitjacket of military "security," there is certainly no agreement. It is imperative that the May-Johnson bill be subjected to a real hearing, to a real debate, and that the public receive the fullest access to the views of all familiar with the subject, without the interference of official censorship, before any final action be taken on its extraordinary provisions.

TUESDAY, OCTOBER

Senate Blocks Action Now on Atomic Control

Sets Up Special Committee to Study Bills, Holding Up Legislation Now Pending

From the Herald Tribune Bureau

WASHINGTON, Oct. 22.—Acting obviously on the view that there still is no clear crystallization of policy on control of the atomic bomb, the Senate, without a record vote, approved today the creation of a special committee of eleven members to handle any and all legislation recommended and suggested for development and control of atomic energy.

The action, it was pointed out, will serve to checkmate the recommendations of the Truman administration, made by Robert P. Patterson, Secretary of War, that control legislation, now pending both in the House and Senate in a form approved by the War Department, be enacted without delay.

Establishment of a Senate committee of eleven members suggested by Majority Leader Alben W. Barkley, of Kentucky, after the Senate had voted, 45 to 27, against a committee of eighteen members, it was pointed out, will take some time. It also was emphasized that the committee would be a legislative group, charged with the most important legislation to be considered by Congress in recent years.

Supporters of the special committee, including its sponsor, Senator Brien McMahon, Democrat, of Connecticut, indicated that, unless the delay is too long, it could be advantageous in providing time for Congress to sift and appraise conflicting testimony of experts on the atomic bomb.

The special committee, consisting of six Democrats and five Republicans, Senator Barkley said, will make "a full, complete and continuing study and investigation with respect to problems re-

lating to the development, use and control of atomic energy."

Meanwhile, the House Military Affairs Committee, which has held hit-and-miss hearings on an Administration bill to establish a Federal commission on atomic energy, continued to delay action.

Federal Control of Atomic Energy

Army Tries to Rush May-Johnson Bill Through Congress

By Stephen White

10/23

HT
Mr. White, of the Herald Tribune staff, has been covering the hearings on the May-Johnson bill and other aspects of atomic energy.

THE May-Johnson bill, providing for Federal control of atomic energy, may well prove to be the most important legislation ever to come before Congress. Certainly it is one of the most sweeping acts in the history of either house. None the less, public knowledge of the bill and its implications scarcely exists.

The measure provides for the nationalization of atomic energy. In doing so it grants to a nine-man commission the most far-reaching powers ever yielded by Congress and by the American people—powers so extensive that it is not difficult to imagine the commission becoming ultimately more powerful than the government that brought it into being.

Power to appoint the commission, under the bill, resides in the President, with the approval of the Senate. Any citizen may become a member. In the first commission, three members will be appointed for three years, three for six, and three for nine years. Thereafter, as terms expire, appointments will be for nine years.

The President may remove a member only for cause. The commission itself names its own administrator, who under the bill is granted, curiously enough, even greater power than the commission that appoints him. He serves full time at \$15,000 a year; the commission part time at \$50 a day.

To the commission and its administrator is given "plenary control" of atomic energy. Anything pertaining to atomic energy is theirs to rule. And who decides what pertains to atomic energy? The commission. Any property, land, patents, machinery or industrial establishments intimately connected with production or use of atomic energy, past or future, may be taken over by the commission. It is empowered to act at once, and arrange for payment later. Scientific research on atomic energy may not be carried out without permission. Industrial work must be licensed, and permission or license may be revoked at the commission's pleasure.

Its regulations have the force of law. Willful violation may be punished by fines ranging up to \$100,000 and prison terms up to ten years. Special security regulations carry three times that penalty.

It is not inconceivable that within the lifetime of many Americans atomic energy will be of primary importance in the world's economy, holding the position now shared by coal, oil, water power and all other forms of energy. Under the May-Johnson bill the commission's licensing power might mean life and death to any industrial company; food and clothing to an individual. This is an extreme statement: the proponents of the bill do not envisage any such arbitrary use of power, and the opponents do not fear it. But under the bill it is certainly possible.

The bill was proposed in the House by Representative Andrew J. May, of Kentucky, and in the Senate by Senator Edwin C. Johnson, of Colorado, both Democrats. Neither legislator pretends that the bill is his doing. It was prepared by the War Department, which controls atomic energy at present, through Major General Leslie R. Groves, head of the Manhattan District, and a committee of scientists.

At the first hearing on the bill, Oct. 9, four Administration witnesses testified in its behalf. Then, to the amazement of those present at the hearings, Representative

May, chairman of the House Military Affairs Committee, announced that the hearings were at an end. The intent was to report the bill out as soon as possible.

The maneuver, like the bill, was not chairman May's. It was only a part of a long-range War Department plan. The War Department was eager to get the bill advanced quickly, and the War Department had a reason.

During the entire course of the war the Manhattan District was not loved by many of the scientists who worked under it. They chafed at the severity of its restrictions, and sincerely believed that in many ways the progress of work on the atomic bomb was slowed by General Groves and his office. They were silent because they knew the necessity to the nation's welfare of remaining silent, however painful the circumstances.

With the end of the war they were uncertain of the extent to which their tongues had been freed. They saw the May-Johnson bill and believed that under its provisions the Manhattan District was merely being perpetuated into peace time. They wished to speak out and feared to speak out.

The War Department realized that it was only a matter of time before these scientists would break into action. The scientists assert that the War Department took positive steps to discourage scientists from speaking out: that they were vaguely threatened with loss of their jobs, and the security oath was called to their attention as a subtle threat. This the War Department denies. In any case, there was certainly no attempt to clarify the situation for the scientists, and there is good reason to believe that the confusion among the scientists was not a matter for displeasure in Washington. While it lasted perhaps the bill could be passed.

It was almost successful. But pressure of public opinion would not permit Chairman May to succeed in railroading the bill through his committee. The scientists broke from their chains more quickly, perhaps, than had been anticipated, and the hearing was once more thrown open last Friday.

It was a peculiar hearing, carried on during much of its course in a tone of open hostility. "We will hear," Chairman May began, "from a group of interested people known as scientists."

The first witness was Dr. Leo Szilard. The atomic bomb project was a large one, and it is difficult to single out men for pre-eminence. But certainly Dr. Szilard must be in the first half dozen. He worked on the project before the government was interested: with Dr. Enrico Fermi he interested Albert Einstein in the work, and through Einstein President Roosevelt; with Fermi he provided one of the essential technical advances; and throughout the last six years has been one of the most active and most respected men in the work on atomic energy.

He was introduced by Chairman May as "a Mr. Sighland," and he testified against a constant stream of badgering from the chairman. He was adjured to answer with a simple yes or no, complicated questions, designed to trap him, and was misunderstood from time to time even beyond the natural capacity of Chairman May to misunderstand.

His testimony was important. He gave as his opinion, and that of science in general, that under the rigid regimentation set up for science under the May-Johnson bill, American nuclear science would wither away. He told of the situation under the Manhattan project, where scientists were forced to break clandestinely the security

regulations in order to progress with their work. Science, he said, cannot be departmentalized; if it is it dies. He urged the committee to consider long and well before it passed any atomic energy bill—the fate of America as a world power was in the balance.

That the War Department was willing to pass up no means by which passage of the bill might be expedited was illustrated at the close of Dr. Szilard's testimony. Representative R. Ewing Thomason, Democrat, of Texas, conferred for five minutes with a uniformed member of General Groves's staff; then, by a course of insinuating questions, based on facts available only to the War Department, attempted to accuse Dr. Szilard of seeking personal profit from patents he holds on atomic energy processes. Dr. Szilard emerged unscathed from the questioning, but it was certainly Representative Thomason's intention to have the insinuation stick, and in the cold print of the committee's records it will probably tar Dr. Szilard badly.

The questioning was finally concluded, while Chairman May complained testily that "Dr. Sighland" had used 1 hour and 40 minutes of the committee's valuable time.

Three further witnesses appeared. One, Dr. H. C. Anderson, who has worked on the atomic bomb since the beginning of the project, complemented Dr. Szilard. Dr. A. H. Compton, who directed plutonium production, took a course mid-way between that of Dr. Szilard and the War Department. Dr. J. Robert Oppenheimer, until last week head of Los Alamos, where the bomb was actually made, supported the bill whole-heartedly.

Then, with others eager to be heard, the hearings were once more abruptly closed. But from this second day of testimony two things became clear.

First, there is actually little dispute concerning the bill between the scientists and the War Department. The scientists know some sort of rigid control is necessary: they wish it to be soundly studied, then carefully written. The War Department believes there is real danger of the problem getting out of control during any extended period of study. Action must be taken now, so that the explosive international situation can be considered. Work, all but suspended during the present period of uncertainty, must be set in motion again.

The second outcome of the hearing was the certainty that the War Department's opportunity to rush the bill through is gone. The scientists now know their strength. The May-Johnson bill, so stormily begun, can hardly be expected now to go unnoticed through House committee and House, Senate committee and Senate.



The Scientists Revolt

By MICHAEL FOOT,
Member of Parliament

(Copyright, 1945, New York Post)

London, Oct. 23—Scientists are in revolt. Once upon a time they were content to stay quietly behind their laboratory doors. Clever entrepreneurs would buy up their inventions. Exploitation was left to the capitalists and control to the politicians. Neither was the concern of the scientist.

The statesmen and capitalists were jealous of their empires. They wanted no intruders. But now the scene has changed. The scientists have left the laboratories, and are on the hustings in the name of democracy. If we are wise we shall listen.

When President Truman recently announced America's determination to keep the atom bomb secret, English scientists already had protested against such a policy. Now their protest is matched by an even louder outcry from America, whose scientists demanded and won representation at the Senate Military Affairs Committee discussions on the subject.

Why Politicians Object

We can understand why politicians want to keep them out. The scientists have expressed a well-nigh unanimous opinion against monopoly. They have issued manifestos explaining that the secret will be known by other nations within a few years.

How often have statesmen in this war shielded themselves behind "experts"—expert diplomats who thought it clever to undermine the League of Nations, expert arms manufacturers who objected to being publicly controlled, expert realists who treated every international idea with scorn.

Today scientific experts take their stand against secret diplomats, against those who want to monopolize a new power, against cynics who would brush aside a sane international solution.

A policy of monopoly is one whose disastrous consequences can easily be foreseen. An armament race a thousandfold more dangerous than any before will be encouraged. Every peace conference will be reduced to unreality by ignoring this most potent form of power.

Only Idealists Talk Power

During the war the so-called realists accused idealists and internationalists of excluding the considerations of power. Today only the idealists are paying proper regard to considerations of power. They want a plan to invest atom bomb production in an international authority.

Atomic energy has exploded old ideas of international relations. Private capitalism has suffered a blow no less shattering.

Must Abdicate Sovereignty

The profit motive has nothing to do with this discovery. Unless we are eager to condemn ourselves to extinction we shall not be fools enough to consign its developments into private hands. If there is a case for private ownership of atomic energy there is an equal case for making the air we

breathe subject to the whims of the competitive market.

It may be within a few years that measureless power will fall into the hands of national states. They must abdicate part of their sovereignty if the warlike propensities of the new weapon are to be controlled.

If the capacities of this new scientific talent are to be developed, the national states must reduce to impotence monopolies and controllers of other sources of energy which will now become superfluous.

America's Congress may not relish the prospect. They want secrecy. They stick their heads in the sand. But who can believe that the ostriches will win? The people will have to struggle to defeat them, but democracy plus scientists is a formidable alliance.

Navy to Test Atom Bomb

Admirals Seek Answer to Query,
Is the Fleet of Today Obsolete?

By ARTHUR KROCK
Special to THE NEW YORK TIMES.

WASHINGTON, Oct. 23—The Navy is endeavoring to make arrangements to test the effectiveness of the atomic bomb as a depth charge against vessels at sea, hoping thereby to get eventual answers to these questions that the new weapon has raised:

(1) Has the atomic bomb made obsolete a modern navy in seagoing formation, whatever the power of its units, just as the invention of gunpower canceled the advantage of men in armor over all others?

(2) Can it at one blow, or several, destroy the offensive and defense strength of assembled naval power at the outset of a war unless a counter-weapon is discovered?

(3) Could this destruction include underwater fighting craft, or will the tests prove that future navies, if confined to submarines and airplanes, can make effective of war despite the atomic bomb?

(4) Since water is non-compressible, will a sub-surface explosion of the bomb crush the surface vessels or wither them by its heat? Will its immediate radius of activity be confined to the present land estimate of 3,000 yards? Or will it crumble faraway shores and cause earthquakes on the ocean's floor?

Good Weather Needed for Test

Nobody knows any of the answers, although scientists have certain preconceived beliefs. But these vary. There are enough atomic bombs in readiness to make a thorough experiment, and targets will not be lacking because it is proposed to collect surrendered enemy warships and obsolete American ones to make up the fleet for the test. The only immediate problems are:

(1) To find the best and safest place offshore, and in deep water; (2) to assemble the targets in very good weather so that, since the ships cannot be anchored and the crews must be removed to a safe distance before the bomb is dropped, they will hold their for-

mation long enough for the trials; (3) to obtain the required expert assistance before the scientists who were engaged on "Manhattan Engineer District Project" (the first bomb preparation) disperse to other activities, and (4) to devise an underwater trigger.

What happened when the atomic bombs were dropped in New Mexico and Japan give a pretty good idea of their probable effect on ships as dispersed surface targets, or massed at anchorage as in Pearl Harbor on Dec. 7, 1941. But performance under water, even against a fleet in harbor, remains in the realm of the unknown. This is partly because the atomic bomb result is actually the release of intense heat and not a concussion.

Hydrostatic Trigger Foreseen

As a concussant, TNT is a much more powerful substance. At a radius of 150 feet, TNT depth bombs have made the crews of "live" submarines feel "very uncomfortable," according to the Navy, which has tried this experiment with units of our own undersea fleet. But that effect was shock. The atomic bomb, being a release of heat, may vaporize the surrounding ocean and pulverize the surface ships, or it may do something very different, within a radius as yet unknown.

The technical problem arises from the fact that atomic bombs are set off by trigger. For their use under water a hydrostatic trigger will probably have to be contrived.

When the test is arranged and made, the result may be proof that a great fleet, including the most powerful modern vessels of war, can—if concentrated—be dissolved and the crews obliterated by a single atomic bomb used as a depth charge by one aviator. It may be proof that the energy thus released can change the contours of the ocean bed and of distant coast lines.

The Navy intends to find out, if it can.

NYP 10/24

Einstein, 59 Others Wire to President: Kill Atom Control Bill

Prof. Albert Einstein and 59 other prominent Americans have telegraphed to President Truman demanding the withdrawal of the May-Johnson bill for controlling atomic energy.

This bill, they said, would "vest the greatest powers ever delegated in American history to a government administrator responsible neither to Congress nor to the President."

It would discourage exploration of vast social advances, said the telegram, and "those scientists who co-operate with the administrator" would "have to sign away their independence and work as scientific slaves of a virtually irremovable official."

Among the 60 signers are Dr. Harlow Shapley, director, Harvard College Observations; Bishop

G. Bromley Oxnam, New York Area, Methodist Church; Leon Henderson, Research Institute of America; Raymond Swing, Norman Cousins, Leo Cherne, executive secretary, Research Institute of America; and 20 atomic scientists of Oak Ridge, Chicago, and the Manhattan Project.

HT 10/24

Scientists Hit 'Totalitarian' Atomic Control

Einstein and Bishop Oxnam Among 60 Leaders Who Assail May-Johnson Bill

Sixty men and women, including Dr. Albert Einstein, the Right Rev. G. Bromley Oxnam, Bishop of the New York Area, Methodist Church, and twenty-seven scientists who worked on the atomic bomb, urged the withdrawal of the May-Johnson bill for plenary Federal control of the atomic energy in telegrams yesterday to President Truman and the members of the House Military Affairs Committee.

In the telegram, framed at the end of an eight-hour conference, the proposed legislation was assailed as establishing "totalitarian authority" and as discouraging, rather than promoting, further progress in the field of atomic physics.

"The May bill could have the effect of treating knowledge as criminal, and those who possess it enemies of society," the telegram asserted. "The bill might also 'promote a competitive armament race, while at the same time tying American scientific hands and brains," it continued.

Call for a New Bill

"A new bill should be written which more clearly recognizes the dual aspect of atomic energy and which emphasizes the peace-time opportunities science has presented to us. We cannot abolish atomic energy any more than we can outlaw electrical energy. Fire itself creates great havoc, yet we use it intelligently. The release of atomic energy has opened up a vast new horizon in human development."

"We urge the withdrawal of the May bill. We further urge full and extended public hearings on this or any other legislation pertaining to atomic energy," the telegram concluded.

The signers included Leo Cherne, executive secretary of the Research Institute of America, who was chairman of the group; Dr. Frank

HOUSE GROUP REVISING ATOMIC CONTROL BILL

Special to THE NEW YORK TIMES.

WASHINGTON, Oct. 23 — The House Military Affairs Committee worked over the Administration's atomic energy control bill in an executive session today, and it was reported that many amendments were adopted.

It was also said that at least one more hearing would be held to study all aspects of the atomic energy problem before the committee brought out the measure. One member said that the committee wanted to take all the time necessary for most careful consideration of so important a problem.

The Administration's bill would nationalize control and development of atomic power, placing the whole problem in the hands of a permanent commission.

Tomorrow, Senator Kenneth McKellar of Tennessee, presiding officer of the Senate, is expected to name the chairman and ten other members of a special Senate committee that was authorized yesterday to study the development, use and control of atomic energy during the term of the present Congress.

Aydelotte, director of the Institute for Advanced Study at Princeton University; Cass Canfield, chairman of Harper & Brothers; Norman Cousins, editor of "The Saturday Review of Literature"; Dr. Einstein; Albert D. Lasker, president of the Lasker Foundation; Mrs. Albert D. Lasker, secretary of the National Committee for Mental Hygiene; Professor Robert MacIver, of the department of social science, Columbia University.

Other Signers Listed

Also, Lieutenant Cord Meyer jr., United States Marine Corps, aide

to Commander Harold E. Stassen at the San Francisco Conference; Walter Millis, editorial writer, the New York Herald Tribune; Professor Allan Nevins, department of history, Columbia University; Bishop Oxnam; Gifford Pinchot, former Governor of Pennsylvania; Alexander Sachs, economist associated with the atomic-bomb project; Dr. Harlow Shapley, director of the Harvard College observatories; Raymond Swing, radio commentator; Dr. Harold Urey, winner of the Nobel Prize in chemistry and a prime mover in the atomic-bomb project.

War in the Atomic Age

By 1955, if there are no agreements to the contrary, we will be living in a world armed with atomic weapons.

What would happen then if war broke out between major powers?

In the nation attacked, no city of 100,000 or more population would remain as an effective operating center AFTER THE FIRST HOUR OF WAR.

In the nation attacked, one of every 10 persons would be killed WITHIN THE FIRST HOUR.

These are no visionary predictions. They are the considered statements of one of the world's greatest scientists, Prof. Arthur H. Compton, Chancellor of Washington University, St. Louis, winner of the Nobel Prize for physics, who worked on the atomic bomb project from the start.

In a series of three articles, "Atomic Power in War and Peace," he tells Americans the startling, sobering facts of this new force which science has loosed in the world.

The series begins in THE MIRROR TOMORROW. The editors of The Mirror believe Dr. Compton has done America a great public service, and that no American should miss one word of his amazing revelations.

HERALD TRIBUNE,

Atom Bombs

(Continued from page one)

waves could be caused by no explosion men can make, short of a future man-made earthquake. A bomb dropped nearer the surface would expend most of its energy in vaporizing water, and would be accordingly even less potent at a distance. The water itself would safely disperse radio-active end products.

The second test, naval authorities and scientists agree, will produce much the same effect as an atomic explosion over land areas and will be effective over similar distances. It will determine, however, the specific effect on ships—whether it will capsize them, crush their hulls or simply wreck their superstructures.

No date for the experiments has been set by the Navy, but they probably will not be held for many months. Exhaustive preparations must be made to record the results, to insure adequate precautions and to perfect such details as a device to detonate the bombs under water.

Preparations are proceeding with the full indorsement of Fleet Admiral Ernest J. King, chief of naval operations, who will direct and supervise the tests.

There was no indication today of whether the Army is also planning further tests of the military uses of atomic energy. The Army already has at its disposal all the information gained from the explosion of the only three atomic bombs ever exploded—the one tested in New Mexico and the two dropped on Japan—but is reportedly interested in the effect of a new super-atomic bomb.

The Navy's decision to test the potency of atomic bombs against ships was cheered by members of Congress, several of whom had already urged such a step. They also hailed the Navy for its apparent change of attitude toward new weapons since post-World War days. Then the Navy had to be goaded by advocates of air power, including the late William Mitchell, before agreeing to the now famous tests in which planes bombed and sank captured German ships ranging from a submarine and destroyer to a reputedly unsinkable battleship.

SCIENCE SECRETARY URGED IN CABINET

Dr. Dunn of Columbia Asserts
Research School Be Viewed
as 'an Emergency Matter'

Special to THE NEW YORK TIMES.
WASHINGTON, Oct. 24—The obligation of government to support and encourage research in the basic sciences was urged as "almost an emergency matter" by Prof. L. C. Dunn of Columbia University, at the opening of today's hearing before the joint Senate subcommittee on the proposed National Research Foundation. He proposed a new department of government to be headed by a director with Cabinet rank.

"The voice of the secretary or director of scientific research should be heard in the making of national and international policy," said Dr. Dunn.

As a department with Cabinet representation, scientific research would be, and should be, Dr. Dunn argued, responsible to public opinion and public needs and as accessible to the effects of public opinion as are other departments of the Government.

Senator Magnuson, who presided at the hearing said he still believed that direction of the foundation "by a board of highly qualified members" was the better method. He approved, however, the suggestion of Dr. D. W. Bronk of the University of Pennsylvania, that scientific attachés be added to the staffs of American embassies abroad.

Preference for a central administrative organization, in which authority would be vested in more than one individual, was expressed by Dr. Bronk and other witnesses, including Dr. Robert F. Griggs of the National Research Council, and Dr. E. W. Sinnott of Yale. All agreed that only by reliance on a diversity of judgments, and operation through a multiplicity of directive channels, could the necessary freedom for scientific exploration be assured.

Agreement also was unanimous with Dr. Bronk's further insistence on assurances that foundation funds would be allocated by scientists or others having "an intimate familiarity with the methods and objectives of research."

"I stress the necessity for setting up adequate safeguards against control of research by scientifically incompetent administrators because I have frequently encountered the unfortunate and wasteful consequence of such control during the war," said Dr. Bronk.

Inclusion in the foundation program of special provisions for research in the basic biological sciences also was urgently recommended, as of primary importance to the development of medical, agricultural, engineering and very nearly all other research science programs.

Education and training of able men and women for teaching and research was likewise endorsed as one of the most essential features of the foundation plan, to make up, it was said, for the time lost during the war when pure science research in many fields was almost at a standstill.

"It is for the United States now to carry on the torch for basic science," said Dr. Selman Waksman of Rutgers.

ATOM COMMITTEE DELAYED BY ROW

McMahon, Its Sponsor, Center
of Battle on Chairmanship
—Senate Sharply Split

Special to THE NEW YORK TIMES.
WASHINGTON, Oct. 24—A fight has developed in the Senate over the chairmanship of the new special Senate Committee on Atomic Energy—one of the most powerful legislative agencies ever created—delaying the study of the problem how the United States will ultimately control atomic force.

The fight revolves around Senator Brien McMahon, Democrat, of Connecticut, who achieved prominence as a Federal prosecutor before he entered Congress last January. As sponsor of the resolution creating the committee he should be its chairman, according to the precedent governing special committees. Ranged against him are the traditionalists, who asserted that in this instance the seniority rule should obtain and a senior Democratic Senator should have the distinction of heading the body that will determine how atomic energy is to be developed, used and controlled.

Powerful forces are ranged on both sides, it was reliably learned, and a deadlock was indicated when Senator Kenneth McKellar, Democrat, of Tennessee, presiding officer of the Senate, named neither the chairman or the other members of the committee. During the debate preceding its creation on Monday, Senator McKellar indicated distaste for the task of choosing the chairman. He asked the Senate to elect him, but nobody moved to settle the issue that way.

Names Learned Elsewhere

The names of the members of the committee were learned, however, from a highly reliable source and, unless there are last-minute changes, they will be:
Democrats—McMahon, Edwin C. Johnson of Colorado, Theodore F. Green of Rhode Island, Sheri-

dan Downey of California, Clyde R. Hoey of North Carolina and Richard B. Russell of Georgia.

Republicans—Arthur H. Vandenberg of Michigan, Warren R. Austin of Vermont, Bourke B. Hickenlooper of Iowa, Eugene D. Millikin of Colorado and former Admiral Thomas C. Hart of Connecticut.

One of the six Democratic members will be chairman and five of them have seniority over Senator McMahon.

Another course would have been to let the committee members elect the chairman. But Senator McMahon's resolution provided that the selection should be made by the Senate's presiding officer. During the debate Senator Johnson, who as senior member and acting chairman of the Military Affairs Committee as a leading contender, argued that the head of the atomic committee should be chosen either under the seniority rule or by a committee election. He did not persuade the Senate to adopt either of these courses, however. And the task was left to Senator McKellar. There was support on the floor for the rule that the chairman of a special committee should be its sponsor.

House Committee Meets

Meanwhile the House Military Affairs Committee held a second closed session, studying the atomic-force problem. It was learned that today and yesterday Brig. Gen. Kenneth C. Royall, who has been nominated to be Under-Secretary of War, had been closeted with the committee, aiding it in revising and drafting the Administration's atomic-control bill.

It was reliably reported by a source close to the committee that General Royall had been able to help the committee by bringing about a meeting of minds between the War Department and of the distinguished scientists who have publicly testified on the bill. A compromise of scientific and military views is taking place with mutual satisfaction, it was said, and the bill is being amended accordingly.

Atom Bomb Is Credited With Saving War Captives

Army Pilot Says Japanese Had
Planned to Kill All Prisoners

BALDWINVILLE, N. Y., Oct. 24 (AP).—An Army Air Forces pilot said today that the atomic bomb caused the Japanese to call off a plan to shoot all their war prisoners before surrendering.

Lieutenant Cassa Jay Mercer, who was captured on Bataan and held at prison camps in Korea for more than three years, said in an interview:

"The day of the surrender, we noticed Jap officers and non-coms huddled around the radio, and we knew something was coming. We learned afterward that the atomic bomb had saved us by three days. The Japs were going to surrender, but they were going to shoot all the war prisoners the day before it happened."

Lieutenant Mercer said the information came from a Japanese interpreter, a graduate of the University of California, "who spoke good English and treated us better than any of the others."

HT First Things First 10/25

Nothing so sharply illuminates the thought processes behind the May-Johnson bill (the War Department's bill for the control of atomic-energy development) than the bill's own declaration of purposes. Its objectives are stated to be, in this order, "the promotion of the national defense, the protection of the safety of the inhabitants of the United States, the safeguarding of world peace and the furtherance of the acquisition of knowledge concerning atomic energy." This accurately describes the May-Johnson bill, and well exemplifies the military mind and the military approach at their worst.

Most thoughtful civilians would reverse the order of the objectives. They would feel that, since these revolutionary new physical forces have been tapped, for good or ill, the furtherance of our own knowledge of them should be the first desideratum; that the safeguarding of world peace—the one certain means of protecting individual safety and defending the nation—should come second, and that the immediate requirements of national defense, while they cannot be neglected in an uncertain world, at least come after the other aims. The Army, however, starts at the opposite end. The results are quite obvious. By putting primary emphasis on short-range national defense, with the corollaries of rigid censorship and dictatorial control, the danger of war is greatly exacerbated while the development of our own knowledge of nuclear physics is stifled. We drive other nations into their own atomic research, make war more probable and at the same time go far to insure that we will be well behind the others in atomic research when the war finally arrives.

One of the gravest objections to the May-Johnson bill is that American scientific workers simply can not and will not function under the kind of military dictatorship which it seeks to impose upon them. To put the whole \$2,000,000,000 apparatus of development in the field of nuclear physics under the irresponsible czarism of the proposed "administrator" (a post which seems plainly designed for the estimable but not spectacularly brilliant Major General Groves) would be to paralyze American work in the field while inciting every other nation to get on with its own research. Control is patently necessary, but not this kind of control. A proper bill would vest it in a full-time and responsible civilian-scientific commission, with considerable powers of condemnation and of license but nothing so sweeping as those provided in

the May-Johnson measure. The savage security penalties are not only absurdly unnecessary, but poisonous in their international effect. The whole emphasis should not be on keeping our own secrets but on securing that no secrets will be kept from us. The whole approach should be civilian and scientific, not narrowly military. Whether we like it or not, we have started a new phase in scientific advance. Our hope lies in our ability to use it creatively rather than in attempting an impossible suppression.

Atomic-Age Lessons

NYT 10/25
Good Intelligence Service, Air Power and Industrial Leadership Our Best Defenses

By HANSON W. BALDWIN

The details of the atomic bomb and its manufacture are still—and will long remain—to the great majority of people, either a closely guarded secret or a scientific puzzle.

But the effects of the plane and the bomb, the rocket and radar and the other military miracles of this scientific age are plain enough. The United States can no longer count on distance for immunity from physical assault, our geographical position is still a strategic asset of major importance against actual invasion by men, but distance and surface forces cannot prevent damaging assaults of terrible consequence through the air.

There are certain conclusions that can be drawn from this. An "atomic Pearl Harbor"—a stupendous and massive attack by surprise in the atomic age now dawning—could mean virtually a crippling blow particularly against an unprepared nation. Therefore, we must never be surprised again.

Intelligence Service First Line

An adequate intelligence service—the world's finest—is today the first line of defense. The present organization in Washington is not the proper one for the best collection, analysis and presentation of information. The intelligence service of tomorrow cannot be tied down to any one or two or three Government departments, though each department must maintain its own specialized intelligence service. But the coordinating agency, the master agency, must be independent of the State, War and Navy Departments and answerable preferably to the Joint Chiefs of Staff. This is Lesson No. 1. If we ignore it, if we do not develop an adequate intelligence service, it will be the nation's peril.

Lesson No. 2 was already clear before the atomic bomb was introduced. The accomplishments of air power are too well proved to be argued. Our second line of defense is in the air—not necessarily air power as we now conceive it, more probably pilotless planes and rockets—and it must be offensive air power, not defensive. Air power, particularly strategic offensive air power, must not in the future be subordinated to ground and sea power, even if the implementation of this lesson means a third and separate Department of Air.

Lesson No. 3 is also a by-product of the pre-atomic age and of combat lessons, but it has been validated by the lessons so far learned from the atom bomb. The lesson is simple; the future of the nation probably depends on pre-eminence in scientific research and development and in industrial "know-how" and production. We proved ourselves in the war masters of mass production, but we often lagged in the race for quality. We have too few scientists and not enough scientific engineers, and the service policy toward scientific education during the war has set us back by some years. Yet the future of our military strength depends fundamentally on the laboratory and the factory—and the hearts of men.

Quibbling on Details Hit

These three lessons are of fundamental importance to our military institutions and to the national future. Yet there is not much evidence that they are well understood. Instead of concentrating on them, we are quibbling about details. We are talking about organization instead of education; we are talking about universal military training instead of scientific training; we are planning hopefully for industrial mobilization but doing

little to induce the men who can keep those plans up to date to stay in Government service. We speak of a single Department of Defense as a panacea, instead of devising ways and means of insuring the fullest possible scope for the development of air power, and, as needed, of post-atomic land and sea power. We speak of military training when we may need disaster training—the training of the whole civilian population in defense against atomic bombings. We speak of unification in blueprint terms instead of in terms of the mind and the heart.

All these questions are inter-related; none can be solved unless the others are solved. They are not being solved today in Washington. They are being discussed piecemeal and with prejudice. They will never be solved—with safety to the country—by Congress acting through separate and biased committees and by the fighting services acting as partisans. The time is short; the time is now. A commission of distinguished civilians, impartial, objective, chosen for their judicial and mental attainments, should be appointed by the President with the consent of Congress to review our entire post-war military program and its relationship with foreign policy in this atomic age. Atomic legislation itself should form part of this study. But in the meantime such legislation—national legislation of vital importance—is pending before Congress. This legislation provides for the creation of an atomic control commission (this commission would have nothing to do with studying our post-war military problems). This atomic control commission would be endowed, under the proposed legislation, with powers so far-reaching and broad that even a cursory study leaves the reader appalled. It is true that legislative grants of such far-reaching powers may be in step with the frightful development of physical power in the atomic age—but there is considerable doubt that the legislation as originally drawn is either desirable or necessary.

Scientists Oppose Secrecy

Scientists say that the emphasis on secrecy in atomic bomb experimentation and development would stifle the development of nuclear physics in this country rather than aid it. Scientists believe in a free exchange of the facts of life—and perhaps an embargo, if that be the national policy, and no international solution is possible, on purely military information. Amendments to insure the freedom of fundamental scientific research and to limit the unparalleled grant of power made to the projected atomic energy commission must be accepted by Congress. Moreover, the rights of property—essential to free men everywhere—must be preserved, something that the proposed act does not specifically do. Under the terms of the present legislation, the atomic commission could apparently sequester and appropriate almost anything in the United States.

If this be necessary to live in the atomic age, perhaps Americans will make even these sacrifices. But let us see first whether it is necessary; let us put first things first. Let us create not only an atomic energy commission, with requisite powers, but also a fact-finding body of even broader scope, a commission to study the whole military problem of post-war America, to consider how atomic energy magnifies that problem and to fit into proper perspective the fast changing roles of all the instruments of war. Until that is done, until an over-all answer is given to the over-all problem, we shall build the post-war military system of the United States on quicksand.

Edgar Mowrer On World Affairs



Atomics—A Question Of Generations

NYP By Edgar Ansel Mowrer 10/25

These are the times that try men's wits—old men's wits. Under the influence of the President and the War Dept., two scientists, Vannevar Bush and James Bryant Conant, with appropriate legal counsel (allegedly), drew a bill for the control of atomic energy.

This has been introduced simultaneously into the House of Representatives and the Senate as the May-Johnson bill.

Mr. Bush and Dr. Conant are very distinguished scientists. They are no longer young men.

Dr. Bush is 55 years old. Dr. Conant is 52. The average age of the nuclear physicists who built the atomic bomb is 24½ years.

Dr. Bush and Dr. Conant have one notion about the bomb which is at the bottom of their thinking about how it should be controlled. Almost without exception, the young nuclear physicists have another idea. They are in vocal revolt against the ideas of Drs. Bush and Conant.

Some of them even go so far as to state that if the May-Johnson bill is passed as written, they intend to violate it publicly as a patriotic act of civic disobedience and go to jail.

That Other, Smaller World

The point—in this writer's judgment—is that Drs. Bush and Conant grew up in a different world. In their world—the world they first learned about—the universe was composed of 92 different sorts of bricks called elements, eternal, immutable, dependable. Together these constituted matter.

Matter was limited and indestructible. Time could be regarded as the unfolding of an unyielding determinism, according to which everything that happened had to happen.

It was an inhuman world but it was (relatively) small. In it a trained mind could find its way without more difficulty than when navigating the crowded front hall at home in the dark.

During the lifetime of these living older men that universe decayed. Today it is completely dead. Not a single one of its cardinal assumptions has stood the test. But the memory of it still haunts and confuses the minds of people born into it.

This Utterly Different Universe

The new universe is utterly different. It can best be considered as, well, a field of cosmic forces, probably, in the end, of one force. The immutable 92 elements composing "indestructible matter" can each and every one be changed into something else. One of them has just been transformed into two brand-new elements. All of them may vanish, to emerge as "pure energy." Energy, mass and velocity are inextricably linked.

The key to this universe is the atom—and most of the atom is empty space. Within that space, fascinating entities called electrons, positrons, protons, neutrons, what-nots, move and have their being. They are "bricks" of the new universe and they are as hard to put your finger on as fleas. Streaming into these atoms from an undetermined source come, like rain from heaven, invisible ultrapotent "cosmic rays."

"Most Anything Can Happen"

Yet—strangely enough—over these limitless forces, mankind, with the atomic bomb, has begun to establish control. Co-operative development of this control is a prerequisite of human survival.

Iron-clad causation has broken down into "major probability." In last analysis, most anything can happen.

In this new freer world the young generation of scientists is

at home. They take it for granted. Compared with the survival problem it offers the problems that haunt the rest of us—political, economic, social, seem temporary. These young people calmly announce that the only safe antidote to the new bomb they have built is world government. When told that this is "impossible," they smile scornfully. Why should anything be impossible when it is also necessary?

To them, science is the key to future human living, the common inheritance of all nations.

The Young Men's Stand

Above all, science must be free. Scientists, not government, must direct research if it is to be successful. Scientists must consult among themselves freely, without interference.

The young nuclear scientists who discovered and built the atomic bomb believe the May-Johnson bill would, if it became law, limit atomic research. It would permit a governmental commission, possibly headed by an outsider, to decide what young scientists should experiment with. It would limit international cooperation in research.

Thereby it would defeat its own ends. Gagged and "directed" American minds would be no match for free minds in other countries. In seeking to secure American leadership in atomic research, the May-Johnson bill would kill that leadership.

Therefore they oppose the May-Johnson bill and hope the President will have it modified or withdrawn.

(Press Alliance, Inc.)

Dark Age Act Put On By Senate Over Atom

PN By ELIZABETH DONAHUE
Washington Bureau 10/25

WASHINGTON, Oct. 25.—The whole future of atomic control, national and international, involving some of the most significant legislation in Congressional history, is today involved in as low-grade a political brawl as the Senate leadership has ever waged over a minor political plum.

At stake in the back-stairs row involving the highest Democratic leaders in the Senate is the chairmanship of the newly created 11-man Atomic Committee sponsored by Sen. Brien McMahon (D., Conn.), liberal internationalist, who by every rule of precedent should get it.

In a courageous battle against a gang of reactionary southern Democrats and isolationist Sen. Edwin Johnson (D., Col.), Democratic leader Alben Barkley (D., Ky.) is today standing firm against overwhelming odds to assure McMahon of the chairmanship.

Although the last 17 special committees created by Congress have been headed by the men who sponsored them, Sen. Kenneth D. McKellar (D., Tenn.), who holds complete control of the appointive power in this case, is bucking McMahon on the thin grounds of "Senate seniority." McMahon is a freshman.

Opposing McMahon for the

chairmanship are Sen. Tom Connally (D., Tex.), the thick-skinned, arbitrary chairman of the Senate Foreign Relations Committee; the isolationist Sen. Johnson; and Sen. Richard Russell (D., Ga.). Although Russell is an internationalist he is generally regarded as a reactionary on domestic affairs.

The 11-man committee, which under a special resolution is empowered not only to investigate atomic energy, but to draft final legislation on its use, is destined to erect the keystone of both our domestic and international policies on the most vital issue now before Congress and the Nation.

Among the measures which will go to this committee is the controversial May-Johnson Bill which is now being amended in the House Military Affairs Committee.

Implicit in this bill are grave questions of monopoly, nationalization of major industries, vital issues on civil liberties and the right of scientists to pursue their work free from the threat of jail and heavy fines, and lastly the fundamental question as to whether the "secret" of the bomb and its processes is to be maintained as a National policy.

Connally, who lost his fight to get the May-Johnson Bill referred to his Foreign Relations Committee, is even more of a domestic reactionary than Russell.

McMahon's third opponent, Sen.

Johnson, while he contends that "atomic energy should be as free as air for all the people of the U. S. A.," has already gone on record against international agreements on its use.

McMahon has promised "full and open hearings" on the May-Johnson Bill, and has put his full weight behind the campaign for immediate international agreements on atomic use and control.

Meanwhile, another freshman Senator, Glen Taylor (D., Idaho), moved into the spotlight with a daring proposal that the United Nations renounce the principle of "national sovereignty" and that the Senate call on the nations to direct their efforts toward "the ultimate goal of a world republic based on democratic principles."

Taylor declared, "the preservation of the peace cannot be left to the whim of sovereign states nor to conferences of foreign ministers."



On the Other Hand

**Atomic Control Law
Would Hogtie Science**

By Lowell Mellett

Many of the scientists who worked on the development of the atomic bomb feel that science, as far as America is concerned, will be placed in a strait-jacket if the present administration bill for control of atomic energy becomes law. They think, further, that passage of the bill will start other nations off in a mad, secret race with us that can end only in some nation putting the bomb to use. The scientists have been making their views known to members of the House and Senate.

Examination of the bill may reveal the causes for their concern. The bill provides that:

The President shall name, with the Senate's approval, nine commissioners, each to serve nine years. The President can remove commissioners for "inability to act, neglect of duty, malfeasance in office, or conflict of interests, or because continuance of the member in office would be inimical to the national defense."

They cannot otherwise be removed. They will receive \$50 a day for attending quarterly meetings and be free to engage in other occupations.

The commission will appoint a \$15,000 full-time administrator and a \$12,000 deputy administrator, who, generally speaking, can exercise all the powers of the commission.

Complete Jurisdiction

The commission will have complete and exclusive jurisdiction over all sources of atomic energy and over all research in this field. (The only exception to this is that the armed forces in time of war or national emergency shall be free to conduct research and to use atomic power.)

The commission's jurisdiction is not limited to matters affecting national security but extends to industrial development and use.

However, "The activities of the commission shall be carried on in accordance with the basic principles established by the President in the promotion of international peace, the development of foreign policy and the safeguarding of the national defense."

The commission is admonished also not to interfere more than is necessary with private research and enterprise and not to further the growth of monopolies.

The President cannot remove the administrator. The commission can.

Control of All Ores

The commission will have custody and control over all government stocks of ores, all government lands containing such ores and all government plants and processes. The commission can buy or condemn all privately owned property of the same kind, as well as technical information and patents, which it may consider related to its duties.

The administrator may conduct

Orson Welles column appears today on Page 42.

research and experimentation and proceed with the development of processes for use of atomic energy for military, industrial, scientific or medical purposes. In this connection he may license any property available to him to any person for exploitation or use on any terms he deems advisable—without regard to any status.

In the case of a foreign citizen or government, such license must be approved by the President. Broadly speaking, no private research or development in atomic energy can be carried on without the administrator's consent.

Heavy Penalties

The commission is directed to promulgate regulations covering anyone doing any work at all in connection with atomic power. The regulations need not be made public, but the penalties for violation are. The penalties range from \$500 fine and imprisonment of not more than 30 days for small and innocent violation, up to \$100,000 fine and ten years' imprisonment for willful violation or gross negligence. For dealing with an enemy, the penalty is \$300,000 and imprisonment up to 30 years. Most violations relate to transmitting information.

This summarizes the bill, but does not analyze it. If you wish to make your own analysis, write to the Senate or House document room for S.1463 or S.R.4280, known as the May-Johnson bill.

The scientists who have been analyzing it have concluded, among other things, that entirely too much power is being placed in the control of a nine-man group and an administrator, whose operations will be as secret as they wish to make them, and who are themselves virtually free from all control.

By Albert Deutsch

Science Has Safety Problem In Release of Atomic Power

WASHINGTON, Oct. 25.—Atomic energy has posed a neat paradox for scientists: While one group has been working furiously to develop it to maximum efficiency as a killing agent, another has been working with frenzied zeal to build up safeguards against its destructive effects on the human body. Prof. Raymond Zirkle, director of the Institute of Radiobiology and Biophysics in Chicago, testifying before the Joint Senate Committee hearings on Federal aid for scientific research, revealed how the unleashing of atomic power has raised new problems for biologists and other scientists.

"The exploitation of atomic energy," he declared, "involves the emission of injurious radiations in amounts which before the war would have seemed fantastically large. Moreover, they are often emitted under circumstances which seriously modify their injurious effects with which no one had had any experience before the war."

"If we are indeed entering an atomic age, more and more of our population will live with these injurious agents as at least potential occupational hazards."

Research in this safety aspect of atomic energy is so expensive, Zirkle pointed out, that it could be conducted on an adequate scale only through Federal support. The scientist stressed two potential uses of atomic energy in medicine:

¶ Some of the new sources of radiation (as in atomic energy) may serve to expand and improve the use of radiations in treatment of disease (as in cancer).

¶ Likewise, they may offer new opportunities for basic research in fields such as genetics which have used the pre-war sources of radiations to great advantage.

Zirkle, like all other working scientists who have testified in the current Senate hearings, emphatically favored the creation of a National Science Foundation to finance

and co-ordinate peacetime research.

Prof. L. C. Dunn, chairman of the Zoology Dept. of Columbia University and one of the nation's outstanding biologists, declared that a permanent Federal-aid program for scientific research was not only desirable but necessary. He declared that, in spite of great advances in biology, our knowledge of the really fundamental questions of life remain unsolved. Here are a few of the vital biological mysteries that can be solved only by large-scale research beyond the means of privately-financed projects:

¶ What causes living cells to divide? (Until science unlocks this secret, we don't know the causes of normal growth in plants and animals and men, nor the causes of abnormal growth that result in cancer and similar disease processes.)

¶ What causes a simple cell to develop into an embryo which develops successively the many complex parts of a human body and mind?

¶ What are the fundamental ways whereby the sun's light operates to produce the food and energy upon which plants, animals and men subsist?

¶ What are the basic physical and chemical mechanisms by which the functions of living bodies are carried out?

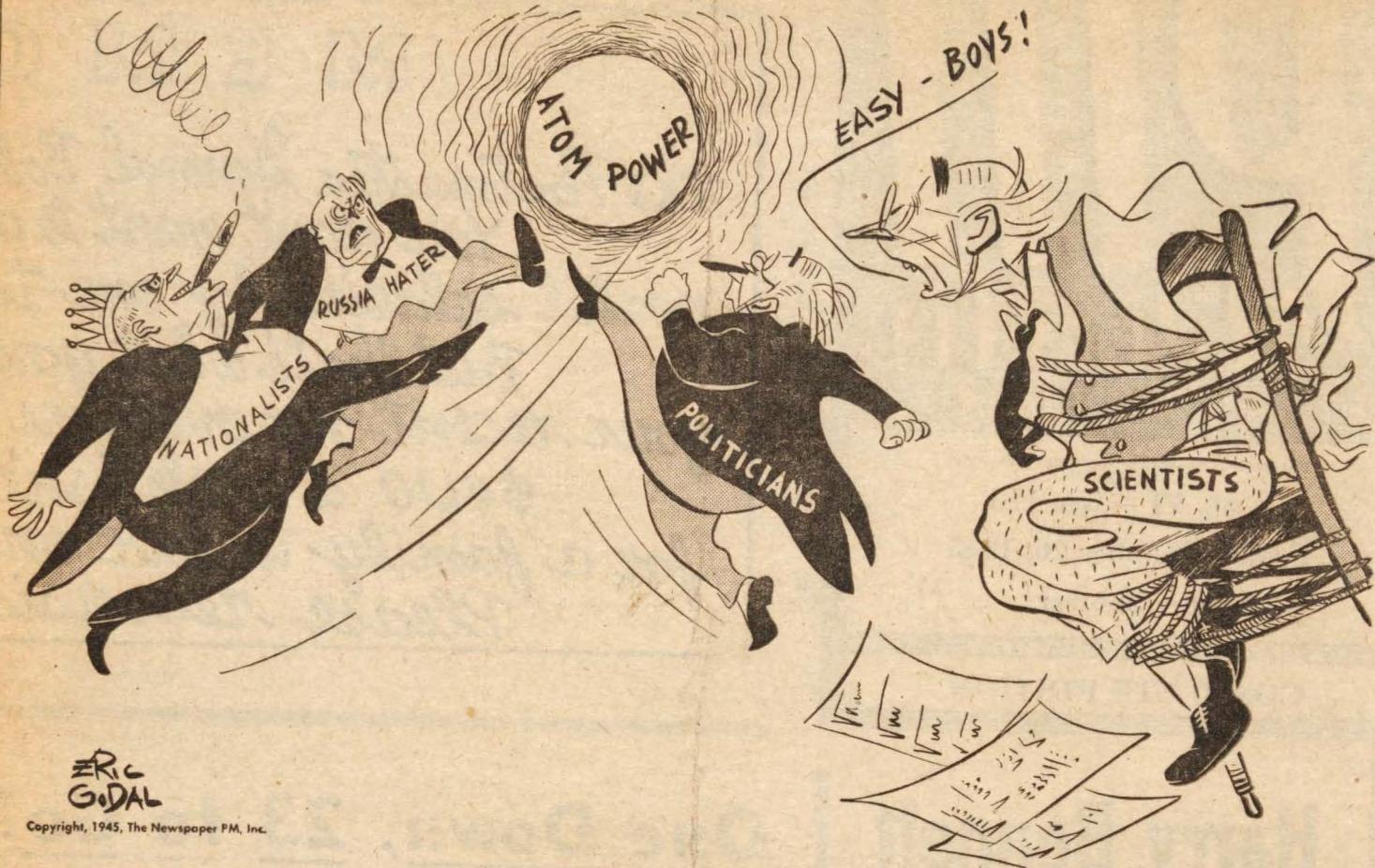
Answers to these questions will give us the answer to life itself. Modern science, which gave us the secret of atomic energy, is now prepared to tackle that greatest of all questions.

All but the Trick

By United Press

HAMILTON, N. Y., Oct. 25.—Russia knows everything about the atom bomb except the trick of putting it together, Dean Sidney J. French of Colgate University said yesterday in advocating a World Foundation of Science.

The foundation must have "thousands of great scientists who will owe allegiance to no national government," French said. In connection with the atomic bomb, he explained the foundation, as he sees it, would have a division concerned with all applications of science to war and its results would be the sole property of the World Organization.



McMahon Asks World Parley on Atomic Control

HT 10/26
United Nations' Association Luncheon Hears Plan for International Regulation

Senator Brien McMahon, Democrat, of Connecticut, asked the United States government yesterday to take the initiative in convening a world conference to discuss international control over atomic energy.

Senator McMahon is the sponsor of legislation adopted Monday which created a Senate committee to consider "the development, use and control of atomic energy" in this country. In an address, relayed by radio from Washington to a luncheon of the United Nations' Association held in the Murray Hill Hotel, Senator McMahon applied the principles behind this measure on a world-wide scale.

Delegates to the international

conference should include scientists, business men and representatives of the people, he said. Recommendations evolving from this meeting, he explained, should be sent to the governments concerned, which in turn would present their programs for regulating atomic energy to the Security Council of the United Nations.

The Senator said he felt that the United States should express willingness to provide the Security Council with full information concerning production of the atomic bomb if the other United Nations agree on their part to turn over "all information of whatsoever kind regarding armament" to this council. He further advocated investing the world council with power to inspect the armament production and scientific advances of every nation.

Dr. Frank Aydelotte, director of the Institute for Advanced Study at Princeton University, indorsed Senator McMahon's proposals, though he said there was some risk involved since "there is no such thing as absolute security" under the present world structure. "Our only salvation lies in bold and generous action, in taking faith in the people of all coun-

tries," he added. "Any attempt to make this thing an American secret is simply to begin right now on an armament race for world war three."

He stressed the fact that the discovery of the bomb was not American, but international. Four of the five major discoveries which made the bomb possible were made outside the United States, he asserted.

Major George Fielding Eliot, military writer for the Herald Tribune and a vice-president of the United Nations Association, shared the views of these two speakers. He cautioned against allowing gloom regarding the atomic bomb to panic this country "into hasty legislation on the subject."

Clark M. Eichelberger, director of the association, presided at the session, which was attended by several hundred members and guests.

King George Speaks of Bomb

From the Herald Tribune Bureau
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LONDON, Oct. 25.—Speaking at a centenary celebration of the Imperial College of Science and Technology at Albert Hall tonight, King George VI warned that the

atomic bomb and its development must be viewed with some measure of apprehension, but that atomic energy may well bring a new era of scientific discovery.

He said new developments in the realm of science under the stress of war had provided limitless possibilities of benefit to all mankind, and he urged that the students of today should regard their knowledge and skill in the light of a trust for the benefit of humanity.

Attlee Averts Bomb Debate

LONDON, Oct. 25 (AP).—Prime Minister Attlee prevented in the House of Commons today a repeated attempt to open a full-dress debate on the future of the atomic bomb, saying that "no full statement can be made until the international aspect has been discussed with the United States and Canadian governments."

That was why Eagan Egan seemed

The Bomb and Security

Discussion of the atomic bomb and atomic energy tends to run to extremes: at any cocktail party there are those who believe the bomb, willy-nilly, seals the doom of civilization; others who contend that the thing to do for our own safety is to hide the frankenstein from the prying eyes of the rest of the world; still others who argue that we can achieve world peace and security by giving away, the bomb secret at once, to all comers.

Let's catch our breath. Atomic energy, whether for military or peacetime purposes, is something new added to our world, and an integral part of it. In many ways it is a great new complication in our lives. Nothing about it lends itself to a pat answer.

Certainly we are not lost because we have penetrated a secret of the universe. We are lost only if we misuse the discovery. And therein is the heart of the issue now being debated in Congress.

Two bills, the May-Johnson bill in the House, and the McMahon bill in the Senate, attempt to come to grips with the enormous political, industrial and military questions which the scientists have tossed in our laps.

The McMahon Bill

We have already discussed the May-Johnson bill in some detail here. It is, in our judgment, highly dangerous because it fails to meet even one major problem created by the developments in the field of atomic energy.

The McMahon bill, though not perfect (could we reasonably expect to attain anything like perfection in trying suddenly to frame new legislative concepts?), does make a good start toward answering some basic questions.

On the question, for example, whether we should "share the secret" of the bomb, the McMahon bill is intelligently drawn. It recognizes that we do not yet live in the best of all possible worlds, but it doesn't slam the door on other nations.

The bill would permit the American representative on the World Security Council of the United Nations to license the Council to sponsor and conduct experimentation in the production and use of atomic energy, on terms to be prescribed by an American Atomic Energy Board.

Such licensing, however, would be permitted only if all other members of the United Nations agreed to hand over to the Council their entire body of knowledge in armament.

Licensing by the U. S. would be contingent also upon inspection by representatives of the Council of all plants, laboratories, etc., devoted to armament and munitions.

Finally, any agreement involving American collaboration with other nations in developing atomic energy would be subject to Congressional approval.

Toward Peace

Thus the McMahon bill—unlike the May-Johnson bill, which is silent on these points—would set our course toward eventual internationalization of atomic energy. This is the goal of tomorrow, toward which we should be striving today.

The safeguards set up in the bill are necessary, but they bear a realistic, not an isolationist, stamp. They can and will be abandoned, should this measure be adopted by Congress, when security becomes a fact for all nations. When that day comes, we won't need controls based on military secrecy.

The fact that eludes us so often in talking about atomic energy and the bomb is that no bill can give us security, although a bad bill might weaken us. Only a foreign policy containing the vision and realism needed for survival in the atomic age can make us secure.

In our trade relations with the rest of the world; by our willingness to give leadership to all nations in settling world problems through consultation and joint responsibility; our specific, courageous support of democratic proposals wherever they may apply—only in these ways can we gain a peaceful world and make the atom bomb obsolete.

Atomic Energy in Congress NYP 10/26

It is possible that in about two years, other industrialized nations may develop atomic bombs a thousand times more potent than the one which vaporized Hiroshima.

Yet the politically-sainted pretense of "secrecy" is being used to withhold the facts about the significance of atomic energy from the American people.

Hundreds of atomic scientists have reportedly had their mouths shut by the threat of prosecution and jail. Under cover of this gag, there is a drive to railroad through Congress a bill which would govern the future of American industry and American science as both move forward to harness the atom.

The Johnson-May bill on atomic energy was given one single day of hearings by the House Military Affairs Committee. Only four witnesses were heard.

Yet the Johnson-May bill is so sweeping that it would in effect give us two Presidents instead of one; the first elected, and the second appointed and possessed of dictatorial powers practically unchecked by Congress, the Administration, or the people.

For as the bill was drawn, the Administrator of atomic energy would not be elected, would not be appointed by the President, would not be confirmed by the Senate.

What's in the Bill?

The Administrator would be appointed by a Commission on atomic energy. The Commission would be appointed by the President with the consent of the Senate. It would consist of nine members serving for nine years, their terms staggered so that three members would be appointed every three years.

The members of the Commission could not be removed by the President except for particular cause. Unlike the heads of government departments, they would not change with an incoming Administration, they would not reflect the popular mood as expressed in the choice of a new President. It would be a rare combination when a President could in a single term appoint a majority to the Commission, and thus control or remove the Administrator.

The Administrator, who as the bill was drawn would likely be an Army or Navy big shot, could take over a plant as big as Willow Run without even letting Congress in on the secret. He could order the dismissal of employees of any government agency for talking out of turn.

He could grant or refuse atomic licenses at his whim. There would be no appeal, and the absence of adequate safeguards could open the way to dangerous monopolies.

Nationalization should guarantee free and equal access to the productive, non-military aspects of atomic energy, safeguarded by wide-open publicity and democratic control.

On the contrary, the Johnson-May bill would take control of atomic energy away from the people, load it with secrecy and vest it in an unrepresentative and irresponsible official.

It Won't Control the Bomb

It would saddle us with a permanent peacetime censorship and end our scientific freedom. Scientists could get 30 years in jail or a fine of \$300,000 for discussing everyday physics with each other.

They could not exchange information with their international colleagues—yet without contributions from Stockholm, Copenhagen, Birmingham, we could not have developed the atomic bomb. This attempt to lock up scientific knowledge would mean that America would rapidly fall behind other nations in research.

But fettering American science would not deter researchers abroad from the inevitable independent development of the atomic bomb. When that happens the Johnson-May bill, which demands such fatal sacrifices of our freedom, offers us no security.

The gagged scientists have tried repeatedly to warn us that there is no visible defense against the atomic bomb, and that our only hope lies in international control.

Unlike the far saner McMahon bill in the Senate, the Johnson-May bill makes no provision whatever for setting up international machinery to prevent the use of the atomic bomb and to control atomic energy.

Senate Committee Now Takes Atomic Bomb

The Senate, last Monday, adopted a resolution appointing a committee to study the development, use, and control of atomic energy, after three hours of debate as to whether the committee should have nine members or 18, whereupon they compromised on 11.

Whatever the number of committee members, they will get nowhere if they compromise on the atomic bomb. They will get nowhere unless they start with the acceptance of five fundamental propositions:



Proposition I.

The secret of atomic disintegration by the fission of uranium is but merely an engineering proposition and will be available within six months to fifteen years to all nations with able physicists, modern industry, and access to uranium ore, which means all vast countries, and small countries which might look to great states for their protection or yield to them from fear—notably Czechoslovakia and Belgium.

Proposition II. The atomic bomb can be used for no good purposes whatsoever; it cannot be controlled; it cannot be an instrument of peace; it cannot be a weapon of defense; it is, by its nature, a weapon of aggression; and its continued existence will give the advantage to (a) totalitarian governments which can make blitz attacks without vote of the representatives of the people; (b) totalitarian states which can shroud themselves in secrecy by rigid internal police controls, prohibition of free speech, press and science, and prohibition of free movement within their territories; and, (c) states of vast area, widely dispersed industries, and immense populations.

Proposition III. The atomic bomb, as an instrument of war, could instantly destroy without possibility of retaliation all states of small congested area such as Holland, Belgium, Great Britain and probably France, and set adrift all empires whose central organs are in such areas, such as the British and the Dutch. In the long run, therefore, atomic warfare favors the Orient against the Occident, despotism against democracy, world dominion against world association.

Proposition IV. The atomic bomb, by passing all advantages to the aggressors, is a terror instrument of unlimited political blackmail in the hands of any government that wishes so to use it. Its possession by despotically controlled governments, able to launch it without restraints imposed by public opinion, will inevitably lead to step-by-step indirect aggressions performed without its use in defiance of all other national rights, and therefore to the possibility of world dominion by blackmail, without war. If, for example, in exclusive possession of the atomic bomb Hitler had owned and demonstrated it before the attack on Poland, no one could or would have resisted.

If in the future any despotically controlled government of vast territorial extent and in possession of the atomic bomb gives the world reason to fear its aggrandizements, it must either be immediately struck down without warning by another state possessing somewhat equal advantages, with the probability that the result will be mutual annihilation, or the world must turn appeasive and servile.

Proposition V. Atomic science, as the property of any government, empowered totally and secretly to control its development and use and threaten scientists and workers with jail for divulging information can become a domestic instrument for overthrowing democracy and es-

tablishing totalitarian despotism.

Must First Digest All 5

These are the five unanswerable propositions which the Senate committee must digest before thinking any further. The United States Government did not digest them before it recklessly let loose the atomic bomb, despite the fact that the majority of scientists who created it, did foresee them, and warned against its unconsidered use, being contemptuously overruled by the War Dept.—as they are still being bullied especially whenever they use the word "morality."

"Hand to Mouth"

We are governed—everywhere—by men who seem incapable of systematic thought, foresight, or imagination. They lead us from hand to mouth—from Yalta, to San Francisco, to Potsdam, never giving any reasons for their acts, and never showing any sign of competence to foresee the chain of events logically likely to result from their momentous decisions which are really snap judgments.

What Should Have Been Done

The Senate committee should focus, not only on the above propositions, but on the fact that when, at San Francisco, the United Nations deliberations gave birth to a mouse, the United States had already given birth to the atomic bomb. The place to have used it was right there. The conference should have coincided with the demonstration in New Mexico. All the delegates should have seen it.

And then the United States should have demanded a real world organization.

Furthermore, the decision as to whether it was to be used in this war should have been taken by vote of the San Francisco assembly, so that in any case the United States would not bear unilaterally the onus of first using against populations the worst weapon of extermination ever created.

So Little, Comparatively, Required

If the Senate committee will heroically face these propositions it can come to sound conclusions. It is possible that it is not too late to use the atomic bomb as an instrument—not as a weapon—of defense, not militarily, but politically and psychologically. But to do so requires an infinitesimal fraction of the same systematic thought that went into the creation of the bomb itself.

In future columns I shall try to pursue a train of thought with something approaching the logical processes of science.

Atomic Bomb Seen Increasing Necessity for Military Training

Truman's Position Defended, and Argument That Cosmic Weapon's Effectiveness Makes Defense Moves Futile Is Called Dangerous Foolishness

By Major George Fielding Eliot

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The atomic bomb has not made military training unnecessary. It has, if anything could do so, made it even more necessary than before. We should understand this clearly, for the opponents of universal military training are serving us up a great deal of half-baked thinking on this point.

Despite the fact that all experience warns us that technological advances in weapons have invariably demanded more and not less man power, plus more and not less thorough training, we are still deluged with all sorts of statements and pronouncements that those who are soberly asking for universal military training are relics of the bow-and-arrow age who have not considered the effects of atomic power on our future security.

These people would persuade us that they have a better understanding of these effects than the President of the United States, who has all the available information at his disposal. They would persuade us that the chief of staff of the Army has not thought the matter through from the standpoint of what they call "the atomic age."

View Called Dangerous Nonsense

The basis of their argument seems to be something like this: Military training is useless because there is no safety except in preventing another war. If the war starts we shall be destroyed in a few hours. Our trained men will be of no service. There is no defense against the atomic bomb, therefore it is useless to prepare one.

This is just nonsense. It could be dismissed as such if it were not such dangerous nonsense.

It is dangerous because so many people, and people of influence, are saying these things.

For example, Elmer Benson, chairman of the executive council of the National Political Action Committee, says that the President's message is "an invitation to an armament race. Our national strength should never be in arms. The President's message is a message for the pre-atomic age, not for the world of today."

The United Council of Church Women, meeting at Washington, passed a resolution opposing universal military training, largely on the ground that it was "pre-atomic," and one woman added an excited shriek to the effect that "the integrity of our homes, churches and schools is at stake." It is, indeed, if the views expressed in that resolution shall unhappily prevail.

Representative Chet Holifield, of California, whose remarks are typical of some Congressional opinion (not all, fortunately), said after hearing the President's message: "He failed to evaluate the world-shaking impact of the atomic bomb upon past military methods, which world-famous scientists believe to be obsolete."

Even so sober and well balanced a voice as that of Raymond Swing asks "whether war itself has not so changed its nature that armies will be of no use, not even to serv-

ice the atom bomb and other modern weapons. . . . Only that country that strikes first will be able to strike at all."

The logical outcome of this line of thinking is that all military preparation is useless in "the atomic age." If it will not help us to be secure, there is no point in spending a penny on it. Are these ladies and gentlemen prepared to advise that we should disband the Army and Navy, do away with the War and Navy Departments, and face the world unarmed and helpless? We might as well, if they are right; if indeed there is no defense against atomic attack, if indeed "only that country which strikes first will be able to strike at all."

But that is not true. When Senator J. William Fulbright tells us that 40,000,000 Americans can be destroyed at the first blow, in a single night, he is envisaging a situation in which we will be prepared neither to defend ourselves nor to strike back. No defensive measures, of course, will be 100 per cent efficient; but defensive techniques against the arrival of airborne missiles of any kind, atomic or otherwise, do exist, and will be improved, and new ones will be devised. They will not be able to give us assurance that no bombs can get through to their targets. But they will, if we get man power and training to make them effective, be able greatly to reduce the effectiveness of any surprise attack and to preserve at least a considerable part of our counter-offensive power, providing that power is sufficient in quantity and quality and adequately dispersed over the vast area which we must defend. This again depends on having enough trained men as much as on any other factor.

Might Will Help Keep Peace

Of course, we do not want any such war. Of course, our principal objective must be to make such arrangements with other nations that such a war will be made impossible. But will weakness increase our influence to that end? Or will the fact that any attack upon us will involve such risks as to be suicidal strengthen our position and our voice in the councils of nations?

Common sense provides the answer to those questions, reinforced by recent and painful experience. In the atomic age, just as in pre-atom days, war and security against war will require both men and machines. Without the machines the men will be increasingly helpless. But without trained men, and plenty of them, the machines will be useless. The nation which deliberately deprives itself of either is offering an invitation to the aggressor of the future until a world-security system has been established, tested and found dependable.

McMahon Urges World Exchange

First Steps for 'Sane Use of Atomic Energy' Outlined by Senator

By ELIZABETH DONAHUE
Washington Bureau

WASHINGTON, Oct. 26.—While the Senate leadership waged a back-stage battle over whether Sen. Brien McMahon (D., Conn.) or a Southern reactionary should control the new 11-man Senate Committee on Atomic Legislation, McMahon warned that "the first step towards a sane use of atomic energy is to exchange views with other nations of the earth."

The freshman Senator, who, under Senate precedents, is entitled to the chairmanship of the Committee he sponsored, carefully refrained from mentioning the May-Johnson bill or any specific legislation which the Committee may handle.

But in an address via wire from Washington to the American Assn. for the United Nations in New York City, and broadcast over WNYC, McMahon clearly stated his philosophy on the domestic and international issues involved in atomic energy controls.

"We must go ahead," he declared, "to meet the rest of the world with constructive ideas and concrete proposals for making the discovery of atomic energy a boon for mankind."

McMahon's Bill

McMahon was the first member of Congress to introduce a measure calling on the U. S. representatives on the Security Council "to enter agreements" with the Security Council under which the U. S. A. would license research in atomic energy and turn over to other nations what information we have under rules to be prescribed. The bill included provisions that all the other United Nations should reciprocate.

The bill, introduced the first day Congress met after V-J Day, was referred to Sen. Tom Connally's Foreign Relations Committee. It has never been heard from since. Connally is now a serious contender for the chairmanship of the special 11-man Atomic Committee, created under a resolution introduced by McMahon.

'We Are Afraid'

Emphasizing that the discovery of the atomic bomb was "made possible by the work of many men of different nationalities," he said yesterday, "we must promote its peacetime benefits for the benefit of all mankind."

"We are afraid of our great gift. We are frightened by the responsibility which is entailed."

"We have shown the world that we have pioneered in politics, in economics and technology. I insist that we must prove beyond all doubt that we are pioneers in the moralities."

"Every scientist who worked on the development of the bomb," McMahon pointed out, "agrees that the secrecy of the bomb is transitory and fleeting."

Meanwhile, Dr. Henry D. Smythe, Princeton University physicist and author of the famed "Smythe Report" on atomic energy released by the War Dept., told a Senate Committee:

"Continued secrecy means national scientific suicide and interna-



tional scientific isolation fatal to our progress."

Says Japanese Gave Up Work on Atomic Power

(Copyright, 1945, by Chicago Sun and The Newspaper PM, Inc.)

WASHINGTON, Oct. 26.—Japanese scientists had developed a "death ray" which could kill a rabbit at 40 yards and had done some work on atomic energy, but didn't get very far with either, Dr. Karl T. Compton, president of Massachusetts Institute of Technology, told the Senate science foundation hearing yesterday.

Compton, one of the leaders in the development of the atomic bomb, went into Japan to investigate the effect of the bomb and Japanese scientific work about the time the first U. S. troops landed.

The Japs were working on atomic research, he said, but "through some miscalculations" had concluded that not enough energy could be released from atomic fission to cause an explosion.

Can't Keep Atomic Secret — There Isn't Any

There is no atomic bomb secret to share.

This was the conclusion of Dr. Reuben G. Gustavson, vice president of the University of Chicago, and Sen. Joseph H. Ball (R., Minn.) last night on ABC's *America's Town Meeting* broadcast originating from St. Paul, Minn.

Subject of the debate was *Should We Share the Atomic Bomb With Any Other Nation?* Opposing Ball and Gustavson were Sen. Alexander Wiley (R., Wis.), isolationist, and Dr. C. B. Suits, vice president of General Electric.

"The atomic bomb," Dr. Gustavson said, "is based on principles well known by scientists all over the world before the war. One of the best reviews on this subject is found in the *Russian Journal of Physical Chemistry* published before the war. We have no secrets so far as principles are concerned."

Giving added weight to a thesis advanced by most important scientists, Gustavson said it was crystal clear to all thinking persons that any nation with the desire and the

industrial power to make atomic bombs can have them within five years. We were successful in developing an atomic bomb, the Chicago scientist held, because our plants were not bombed as were Germany's.

Ball directed his fire at the War Dept.'s May-Johnson atomic control bill, which he called "an unqualified negative answer" to the question of sharing the "secrets" of atomic energy.

With the bill, Ball said, "we could create a gigantic super-government monopoly which would operate in complete secrecy with authority to make and enforce its own laws to protect its power."

"That is quite a Frankenstein monster for democracy to create, isn't it?" he asked.

Ball had a two-pronged solution for the problem of what to do with our knowledge and know-how on atomic energy. It was:

"First, let's set up our domestic control of atomic energy so as to leave our scientists completely free to exchange their knowledge both

in fundamental research and on its industrial application.

"Second, let's initiate an international conference of both scientists and politicians to develop machinery for sharing the beneficial results of the discovery and controlling its potential destructive effects. Let's say to Russia, France and other nations that we are perfectly willing that their scientists see and publish everything we are doing if they in turn will permit our scientists complete freedom to see and publish everything they are doing."

Listing what might be done to benefit mankind through unleashed atomic energy if free research is allowed to develop its powers, Dr. Gustavson said research can only go ahead in a free world with a complete interchange of all information.

Wiley said we "must redouble our efforts for world peace; keep our powder dry; and keep the atomic secrets to ourselves." Suits confined his discussion mostly to the potentialities of atomic energy.

of Atom Knowledge

Atomic War Would Leave No Winner, Says Compton

Daily Mirror, 10/25

Dr Arthur H. Compton, winner of the Nobel Prize for physics, one of the world's greatest scientists, has written the following and two additional articles to stimulate public discussion and understanding of the future of atomic force. He is one of the men who developed America's atomic bomb.

By PROF. ARTHUR H. COMPTON,

Chancellor, Washington Univ., St. Louis.
Distributed by International News Service.

The great destructiveness of atomic bombs makes it necessary for men to find a way to avoid war.

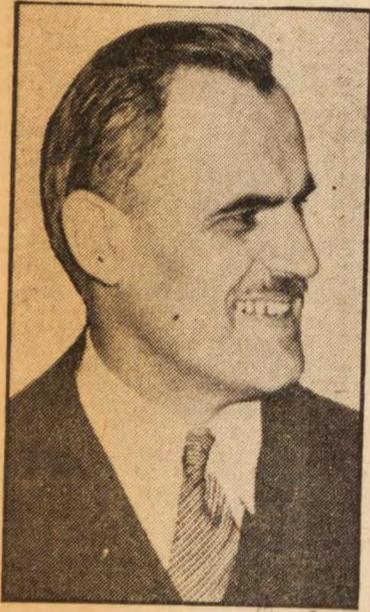
Availability of unlimited power from atomic fission can stimulate the nation's industrial growth and will give us abundant life and the strength to withstand future attacks. If this hope is to be realized, we must choose wisely. World government is now inevitable.

The choice we have is whether this government will be one agreed on by the peoples of the world, or whether the great nations will elect to fight the catastrophic third war that will settle who is master.

In world unity by agreement lies greater life. In the unity forced by another war lies death to millions and disaster to all mankind.

Whether or not we proceed with an armament race, the atomic age will be a period of keenest rivalry—between nations and social systems. The prize is prosperity and world leadership.

It can include peace and security. If we agree to place war



Prof. Arthur H. Compton Helped develop atomic bomb; now looks at the future.

(International Photo)

beyond the power of nations, the race will make life of greater value throughout the world. Such is the prospect of a world strengthened by power unlimited from atomic fission, forced from war by the example of Hiroshima and Nagasaki.

Atomic energy has had its first great application in stopping a war. All indications are it, too, will soon bear the burdens of peace. To clear the air, we must examine what war in the atomic age will mean.

For four years I thought of little else than how to win a war with atoms. I am not an authority on military matters.

It is a mistake to suppose the atomic bomb alone revolutionized warfare. For the first time, it became impossible during this war

to protect one's home by holding the enemy beyond a wall or a fighting line.

This was brought about by armadas of planes guided by radar, jet-propelled, travelling at speed of sound, and long-range rocket bombs. What the atom bomb added was a more efficient means of destroying a target. One plane did the work of a thousand.

But the atomic bomb is in its infancy. Science sees no reason to doubt atomic weapons will be made that, related to the present atomic bomb, will be as the blockbuster to the blunderbuss.

Scientists, driven by need to preserve mankind from the Nazi conspiracy against humanity, went far toward solving a major technical problem of warfare—how to destroy the enemy.

The other major problem—how to protect against damage by the enemy—is correspondingly farther from solution than ever.

If one bomb will devastate four square miles and damage 100 square miles, how many bombs are needed to destroy all of a nation's concentrations of fighting and industrial facilities above ground—100, 1,000 or 10,000? The military must answer.

It is now demonstrated—whatever bombs are required can be produced and delivered to their targets.

Try to imagine what may happen if a war between two major powers should break out in 1970.

Surprise Tactics

Because of the enormous advantage of surprise, Pearl Harbor tactics will be employed.

Jet-propelled planes or rockets with atomic warheads will be sent without warning at each of several hundred of the enemy's major production centers. No city of 100,000 population will remain an effective operating center after the first hour of the war.

At least 10 percent of the attacked nation's population will be wiped out in the initial blow.

If this nation elects to fight back, rockets and planes from hidden installations will carry the reply. The attacker can expect no mercy. Though his citizens may have immediately moved underground, his great cities and surface plants will be annihilated. The fighting will continue until one side chooses to surrender or is unable to resist an army of occupation.

If the U. S. should be in such a war, we should expect St. Louis and Chicago to follow Hiroshima and Nagasaki into oblivion. With destruction of our cities, we should expect about one of every four of us to be killed.

If our nation should win, what would we gain? Perhaps control of the world. But of what value would this be, with our civilization gone, our population decimated?

No Counter-weapons

Those concerned with developing the atomic bomb have not seen any feasible means of preventing bombs from striking targets. Only two counter-measures have been proposed.

First, to disperse our cities, preferably into hilly regions, so more bombs will be required to destroy them. Second, to place all military installations and essential industries underground, with emergency underground shelters for humans.

Such measures would seriously interfere with normal life. We cannot expect them to be put into effect unless a real threat of war is felt. Then it may be too late. The enemy will see the enormous advantage of a surprise attack.

There is talk at Washington about keeping the secret of the bomb. It is recognized by the military and the scientists that we have nothing to hold back that will appreciably affect the rate of progress of a determined rival.

Ahead of the Job

In 1941, working on the basis of knowledge available to all science, we planned steps necessary to produce bombs, calculated their approximate size and effectiveness and predicted accurately how long it would take and roughly but correctly how much it would cost.

It was always possible to see our scientific and technological problems far enough ahead to solve them before they delayed our program.

We knew how to build a chain reacting pile before we could get enough pure uranium and graphite to build it. The tough technical problem of making a non-corrosive coating for uranium slugs was solved by the time the slugs were needed.

The enormous problem of chemical separation of materials whose chemistry had been unknown, complicated by need to use remote control for safety, was solved. The process was working when the materials were on hand. How to keep the operators safe against damaging rays and toxic materials, with which no one had had experience, was learned in time to prevent accidents and delay.

The intricate design of the bomb and equipment for its production were ready by the time enough plutonium and U-235 had been accumulated to begin military use.

We have secrets, yes, plenty of them. It cost us great effort and expense to learn them. I see no reason for giving the secrets away without getting something of corresponding value in return.

But it would be a tragic error to suppose that, by keeping this "knowledge" to ourselves, we can appreciably delay progress of a determined rival in producing atomic bombs.

Our time schedule always was limited by getting materials, building plants for new operations, limited production schedule of the plants.

3 Years, 9 Months

Our industries are expert. Though they were loaded by war jobs, this task had top priority and a devotion born of wartime patriotism. Under these conditions it required three years and nine months from the day the Government gave word to learn how until the first bomb fell.

From scratch, I doubt whether another nation can do the task more quickly. Chances are that, as from August, 1945, it will be at least five years before any nation other than England, with already a good start, can be ready to make military use of atomic weapons.

Allowing for normal delays to make tests and improvements, we may consider perhaps 1955 as the date from which, if no agreements are reached, we will be living in a world armed with atomic weapons.

Any great nation that approaches the problem with de-

termination can make atomic bombs within a decade.

Determination will be necessary, because of the size of the task. The \$2,000,000,000 we required represents the work of 1,000 men for 1,000 years.

Though only a small percentage of our war effort in terms of peacetime projects, this is a large undertaking.

All reason is against letting such a race start. When all are armed, no superiority of one nation will free it from danger.

One man may own a .22 target pistol and another a high-power hunting rifle. Neither is insurance against murder by the other. The insurance is to take away both guns, or the fear of punishment by the police, or most surely of all the development of a social conscience, with murder unthinkable.

What We Should Do

The proper American position as to the military development seems clearly defined.

A—Work with determination and sincerity toward committing to a world government the responsibility, authority and military strength to prevent any nation, including our own, from waging war against another. In such lies the only hope of safety for ourselves and the world.

B—Until this control of war by world government, continue our own military development to the limited objective of preparing weapons adequate to destroy all major surface activities of a potential enemy. We should not seek means to devastate the enemy's countryside or perform the difficult task of rooting out his subterranean installations. We should be prepared to destroy only his surface industries and military concentrations—*which would include his cities.*

Such an objective is within the scope of a normal peacetime military budget, and should not be exceeded even if other nations develop more powerful armaments.

By setting ourselves such a limited program, we shall have strength left to develop vigorously our peacetime industries. We should rely on our industrial and economic strength for our ultimate survival; on sureness of a devastating reply for deterring a possible enemy attack.

When Gen. Spaatz exclaimed, "Wouldn't it be odd if another atomic bomb should never be dropped!" he was expressing for all of us the hope and instinctive faith that war is obsolete.

In the long run it can hardly be questioned that the peaceful applications of atomic energy will be those that will most profoundly affect our lives.

What these important applications will be is, however, as difficult to predict as it would have been a century ago, just after Faraday had laid the scientific basis for electrical engineering, to tell the future meaning of electricity.

At this moment the obviously great field open to atomic energy is that of production of useful heat and power. We also see important though limited medical and industrial applications of radioactive materials, artificially produced by atomic chain reactions.

Perhaps more significant than either are the new vistas that will be opened up by scientific experiments that make use of the by-products of atomic fission (splitting the atom).

Such has, indeed, been the case with such discoveries as x-rays. Fifty years ago it was obvious that x-rays were useful for "seeing" through objects opaque

to ordinary light such as the human body.

It could not be predicted that x-rays would become a powerful weapon in the fight against cancer, or that researches made possible by x-rays would reveal the electron and with it give us the radio and a host of electronic devices.

Such unforeseen developments are the result of every great discovery of science. Now, however,

Atom-Driven Cars Not Feasible: Dr. Compton

Continued from Page 2

you want to know what we can clearly see before us.

Source of Heat

At present, controlled atomic power in the form of heat is in continuous production in large quantities at several plants, especially those at Oak Ridge, Tennessee, and at Hanford, Washington.

The heat from these plants is a by-product, and is carried away in the one case by air and in the other by a stream of water. The useful product is neutrons, which are used in the plants as a means of transmuting certain chemical elements to others of specially useful characteristics.

Previous to the fission chain reaction, the most abundant source of neutrons was the cyclotron which operates on electric power. Per kilowatt of energy used, the fission chain reaction gives some 10,000 times as many neutrons as a Cyclotron, and it is not difficult to make a fission chain reaction plant that delivers 100 times as much power as is used by a Cyclotron.

This means that right now we are using large amounts of atomic power many times more efficiently for the particular process of producing neutrons than the best electrical machine that we have been able to devise.

We have not yet built an atomic power plant that is generating electrical power. This is merely because we have been engaged in winning a war, and there has been no serious shortage of electric power.

A reasonably efficient plant using superheated steam for driving a turbine could be put in operation within a year. Before such plants can be made economical competitors with existing practice, however, a number of years development will be required.

Several Possibilities

While there are several other possibilities, the most obvious method of producing power from atomic fission is to heat a cooling agent such as air or steam or liquid metal in the chain reactor unit, and pass this heated coolant through a heat exchanger which heats the steam for driving a turbine.

Up to the heat exchanger all the design requires new features, among them protection against the extreme radioactivity of everything, including the coolant, that has been exposed to the neutrons.

The chain reacting unit itself can assume many forms. The one essential is that it shall contain uranium, either in its natural state, or if a small unit is desired, enriched with additional U-235 or plutonium.

There is a lower limit to the size and weight of an atomic power plant that is imposed by the massive shield needed to prevent the neutrons and other dangerous radiations from getting out.

Next to cosmic rays, these radiations are the most penetrating that we know.

To stop them, a shield equivalent in weight to at least 2 or 3 feet of solid steel is needed. There are basic laws of physics that make it appear very unlikely that a lighter shield can be devised.

This means that there is no reason to hope that atomic power units for normal uses can be built that will weigh less than perhaps 50 tons. Driving motor cars or airplanes of ordinary size by atomic power must thus be counted out.

Prominent among the advantages of atomic power are the extraordinarily low rate of fuel consumption and consequent low cost of fuel, the wide flexibility

and easy control of the rate at which power is developed, and the complete absence at the power plant of smoke or noxious fumes.

When completely consumed, the fission energy available from a pound of uranium is equivalent to over a thousand tons of coal.

With the pre-war price of uranium oxide at roughly \$3.00 per pound and of coal at \$3.00 per ton, this would mean the economical use of uranium as fuel if only one part in a thousand of its available energy is used.

In considering the economical aspects there are, however, many other factors. It is not really possible for these to be explored until we have actual experience with atomic power plants.

First is the capital cost. Clearly if one must charge against this cost what is spent in research and development, this capital cost is very high, indeed.

If, however, one looks to a billion dollar a year national industry based on atomic power, the nation can afford a considerable investment in the research and development required to bring this industry into being.

1,000 Tons of Coal

When this development is done, it appears not unlikely that the cost of building and maintaining a large scale atomic power plant may compare favorably with that of a coal consuming plant of the same capacity.

Much remains to be learned, however, regarding the metallurgical and other technical problems involved in constructing a successful plant to transform fission energy efficiently into high temperature heat.

The materials to be used may be expensive. The designs are, however, essentially simple. An inherent advantage of the atomic power unit is that the heat source, i.e., the uranium blocks, can readily be maintained at any desired temperature regardless of how rapidly the heat is being removed. This means that a relatively small size heater unit will be needed, and that corrosion due to excessive heating is controllable.

One notable limitation to the use of atomic power is the need for careful protection against harmful rays. Explosions such as destroyed Hiroshima cannot occur accidentally. Such explosions must be planned for.

There is, however, real possibility of damage to the operating personnel from ionizing rays emitted by the plant itself and by all materials that are taken out of the plant.

It is the problem of the radium and X-ray workers on a grand scale. That the problem can be solved is shown by the fact that in all of the operations of the half dozen or more such plants, some of which have now been working for years, not a single serious exposure has occurred.

All of this points toward using atomic power first in relatively large units where careful engineering and health supervision can be given. An obvious suggestion is its application to the power and heat supply of cities and large industrial plants.

Within ten years it is not unlikely that the power companies designing new plants for city service will be considering favorably the use of uranium instead of coal for purely economic reasons.

This, of course, does not mean that atomic power will put coal out of business. Each will have its own field. For small heating units, such as the kitchen stove, atomic power has no place.

From the point of view of the national economy, the introduc-

tion of such a new source of power is a clear gain.

If it will lessen the cost of heat and power to our cities, it will be a stimulus to every industry. If it reduces the pall of Winter smoke, it will be a boon to us all.

If it gives cheap power where industry and agriculture need it but cannot now get it, it will extend our economic frontiers.

These are possibilities that lie immediately before us.

Atomic power is just one more step along the path of technological progress.

It may be the supreme gift of physical science to the modern age. Clearly its value will be determined by the use to which it is put.

Along with other technical advances the effect of atomic power is to force human society into new patterns.

Let me note briefly three such effects of technology on society that are clearly recognizable.

1—The society that is adapted for survival in the modern world is one in which cooperation occurs between diverse groups spread over large areas. As an example, consider the atomic bomb project, in which about a million people of all types and descriptions and spread throughout the nation worked together to achieve a needed result that could only be achieved by a great, coordinated community.

2—The need for ever increasing training and education at all levels of society. It is because of the mechanical skill of many millions of workers, the know-how of our many technical men and the administrative skill of our industrial and military leaders that our country has come out ahead in this war as in the last.

More Education

It is no disparagement of the American engineers who have done these great tasks to point out that most of the new wartime developments that have led to victory, such as radar, submarine detection, rockets, and especially the atomic bomb, have had to be led by men whose scientific knowledge is far in advance of that supplied by our technical schools and industries in the training of engineers.

To compete in the modern world more people need more training. Nor is this technical training all that is required. Of greater importance is more education for leadership.

In a democratic society, forced into position of world prominence, our citizens as well as our leaders need to understand something about the problems and human needs of all the nations.

3—Only that society can be strong whose objectives include developing the full usefulness of all of its people in enriching the common life. We have come to realize that our greatest strength lies in the many millions of our citizens who are working efficiently and loyally at the nation's tasks.

Widespread education, encouragement of each individual to seek the place in the game where he can play best, opportunity for advancement and leadership—all these have helped to strengthen our society.

In the new atomic age, when social systems are going through a fiercely competitive phase, it is necessary for us to maintain our fullest strength. This means that all possible effort must be given to enable every citizen of the country to contribute his best to the needs of the nation.

The evolutionary law of the survival of the fittest applies to societies as well as to individuals. According to this law the society of the future will inevitably advance along these lines of cooperativeness, of education, and of promoting the service of its individuals toward the common welfare.

If selfish interests or an ill-adapted form of government should prevent our growth along these lines, some other nation or group that can develop more rapidly will pass us by.

You will note that these factors which give strength to society are precisely those that characterize the highest type of citizen. Cooperation: He likes to work with others on a common task. Education: He has learned to do his own useful task and to share intelligently in solving public problems. Service: The central objective of his life is to contribute to the common welfare the maximum that his abilities make possible.

These also are the factors which make life of greatest value to the individual.

My point is this, that the development of the atomic bomb is merely the most recent important step of that steady progression of science that is compelling man to become human.

He must pay careful attention to cooperation, education and the welfare of society if he is to thrive under the conditions that science imposes.

If we will let ourselves grow as thus indicated, the civilization of the atomic age promises to be

the richest that history has known, not only with regard to material bounty but also in its cultivation and appreciation of the truest human values.

The major immediate consequences of atomic power can thus be described as four:

World Government

A—It makes inevitable a world government. If we are wise, we shall take immediate steps to form this government by international agreement instead of waiting for a third world war of unparalleled destructiveness to determine the ruler of the world.

B—Until this world government is established, the United States should limit its defense preparations to ability to reply to any attack that may be made against us with such strength as to devastate our enemy's important surface installations. This is a defense objective which we can achieve without seriously straining our national resources.

C—The most important immediate peaceful application of atomic energy is that of supplying heat and power from large installations, especially in areas where power is now relatively expensive. The indications are that for such purposes atomic power will be before many years be competing with coal on favorable terms. These and other applications of atomic processes may have considerable effect in extending our industrial frontiers.

D—The best assurance of national safety in the atomic age, both before and after the establishment of a world government, is to develop the nation's maximum human and industrial strength. This requires keeping all essential industries vigorously alive, and enabling every citizen by appropriate training and employment to contribute to the common welfare as his abilities permit.

Because of the critical problems that the release of atomic energy has helped to precipitate, urgent attention is needed to the education of wise leaders, to the cultivation of a desire to cooperate on our common tasks, and to the growth of a spirit of human service.

Bomb Control Favored

World-Federal Plan Advocated to Avoid Armament Race

The writer of the following letter is Rutherford Professor of Astronomy at Columbia University.

NYT 10/28

TO THE EDITOR OF THE NEW YORK TIMES:

General Marshall has stated that we are laying up a supply of atomic bombs now, which is at a time when no other country is as yet in a position to do the same. Just how many of these weapons we have in readiness is not known. If the present production is kept up, we will doubtless be able to accumulate in the next two years, and before any other country has started production, a sufficient number of these weapons to knock out the rest of the civilized world to a degree where, with a large Army, we could conquer the entire world and, possibly, with comparatively few losses on our side. Consequently, our military leaders are at present in a situation that has probably never before occurred in the history of the world.

There can be no doubt that other countries are fully aware of this tremendous striking power of the United States. Just how they must feel about it is perhaps best answered by imagining how we would feel if the tables were turned.

The military advantage, however, is not going to last long. In a very few years, if we think realistically, we must expect others to have similar weapons. We may, as some do, say that just for that reason we must be well prepared, meaning that we should have a considerable supply of bombs and auxiliary equipment to launch them. In other words, it is advocated to start immediately on what is usually called an armament race.

Armament Races Futile

Armament races in the past have always had two aspects. If someone were to make bigger guns he could also, in anticipation of the bigger guns of his competitor, provide heavier armor plate for his ships. In short, it has always been that there is a new defense against each successive weapon of attack and a sort of balance is obtained, whereby, in the end, war remains possible as a game of force frequently held profitable by a country that has, or thinks it has, out-armed another country by a safe margin.

The people of the United States should now ask whether, with the new weapons, if we keep on manufacturing them, we can be reasonably secure in the near future and whether we can keep sufficiently ahead of other countries. It appears that our military leaders tend to the affirmative view. This is not surprising in the light of past history. For example, it has been demonstrated that a fairly small superiority in a naval engagement will in most cases insure victory.

Extrapolating, one may expect that warfare with atomic bombs could be conducted with the same expectation of success. It appears, however, that those who, by profession, understand the workings of atomic power, understood it in fact before the bomb was engineered, the scientists who, probably reluctantly, have lent their knowledge to industry and to the armed forces, are overwhelmingly convinced that no defense against the weapon of their creation is possible—now, at any rate.

Senseless Attempts

If they are right, it makes little difference whether one country has two, or even ten, times as large a supply of atomic weapons as another. If, as Dr. Oppenheimer testified, 40,000,000 citizens could be killed in one single raid, an attempt at security by armament immediately becomes senseless from the point of view of the most cynical considerations of efficiency, and aside from political, moral, and ethical issues.

What, then, can we do if it is true that no safety can be obtained by military preparations, and if we have to admit that, as a consequence of the production of a super-military weapon, the military has been rendered powerless? The question leads inevitably to the necessity of a world-federal control with considerable sacrifice of sovereignty on the part of all countries. In the words of the President, we have the grave responsibility of trusteeship over these weapons. The world-federal control plan gives us the opportunity to discharge this responsibility and to provide for our cities the permanent safety that we cannot otherwise insure.

JAN SCHILT.

New York, Oct. 25, 1945.

Atom Bomb Warning

Danger Seen in Our Developing A 'Meginot Line Mentality'

NYT 10/28

If Dr. Edward U. Condon, associate director of the Westinghouse Research Laboratories, is right, vastly simpler ways of making atomic bombs may soon enable a few scientists with a small plant in some remote haven to end the Anglo-American monopoly of nuclear power. "We must not develop a mentality in which the atomic bomb is our Maginot Line," warns Dr. Condon in The Journal of Chemical Education. He suspects that the atom-bomb plants we have built are already obsolete.

It is by no means certain, he thinks, that the making of atomic bombs requires vast installations. It is conceivable, in Condon's opinion, that some small group of scientists may eventually find a way to make atomic bombs "with only small, inexpensive and inconspicuous equipment.

"To meet this threat," he believes, "we must set up an order that really covers the entire world—one which does not leave us unaware of what is going on in any remote valley in Spain," and also that "we must continue intensive cultivation of fundamental research in atomic physics to the end that we may really know all about this tremendous new source of power, so that we may apply it to useful purposes in the years of peace that lie before us."

CANADA NIPS MOVE TO SELL URANIUM

Disclosure Follows the Taking Over of Eldorado Property —Investigation Goes On

NYT 10/28
By P. J. PHILIP
Special to THE NEW YORK TIMES.

OTTAWA, Oct. 27—Prompt action by the Canadian Government in taking over the Eldorado Mining and Refining Company in January, 1944, prevented private interests from disposing of uranium, the mother metal of the atomic bomb, into private and possibly suspect hands, it has been asserted here.

Prior to the acquisition of the mine by the Government, it has been revealed, Eldorado had entered into certain agreements relating to the sale and other disposition of its products and there had been reason to suppose that there had been irregularities in connection with the operations of Eldorado and the sale or other disposition of its products.

These statements were contained in a minute of a meeting of the Canadian Privy Council on May 7 this year when it was declared desirable that in the public interest an inquiry be made and a committee was set up to conduct the inquiry into the operations of the company.

On Sept. 5, J. Grant Glassco, chartered accountant of Toronto, was appointed with full power to investigate the affairs and operations of the company.

Yesterday in the House of Commons, C. D. Howe, Minister of Munitions and Supply, lifted a corner of the curtain that had shrouded this whole affair when, in reply to Opposition Leader John Bracken, he said that the investigation had not yet been completed. At the same time he tabled the Order-in-Council referred to above which authorized the inquiry and appointed Mr. Glassco as chief investigator.

Publicity Held Essential

The need for this public action, it was said, derived from the fact that an attempt was being made to bring legal action against Mr. Glassco to prevent his investigation. In these circumstances the Government preferred to make public the fact that an investigation had been begun and the reasons for this decision.

Certain phrases used in the Order-in-Council and the powers granted to the investigator are considered here as evidence of the serious character of the suspicions in the minds of governmental authorities. It was Mr. Howe himself who was responsible for the statement in the order-in-council of May 7 regarding the agreements that had been made by the company for the disposition of its products and that there appeared to have been "irregularities in connection with the operations of Eldorado and the sale or other disposition of its products."

The inquiry was begun in May, but it was not until September that Mr. Glassco received extended authority and forty-five firms and individuals were named as being directly or indirectly involved, at least to the extent that an explanation was required.

Bid for Control Indicated

Behind all the rumors is the implication that some one or some group sought to get control of the uranium deposits at Great Bear Lake and to contest the government's expropriation proceedings.

The Canadian authorities are satisfied that the quick action of the Government in January, 1944, prevented any uranium from getting into enemy hands from Canada.

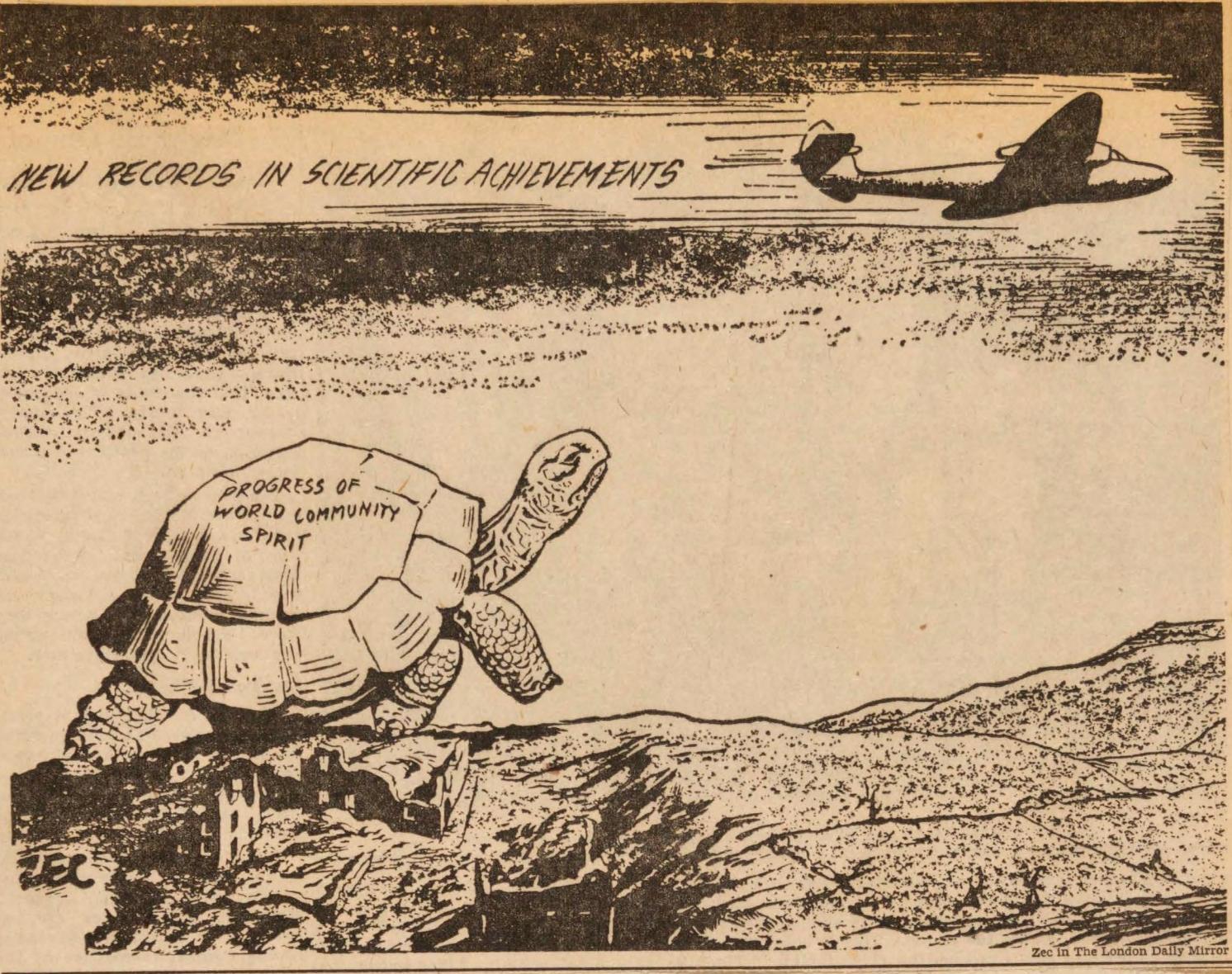
The charges are rather that certain financial interests sought to get control of the world's supply of the basic metal of atomic energy and seize the power to dispose of it in contravention of metals control and other wartime regulations, and for private profit.

In his statement to Parliament

yesterday Mr. Howe did not promise that the report of the investigators would be made public when completed, but that its publication would receive consideration. What he appeared anxious to insure was that the amount of publicity now given to the whole affair would prevent any action to stifle the investigation or any further attempt by private interests to get control of this source of atomic energy.

In addition to expropriating Eldorado, the Government has taken action to secure control of any and all future discoveries of uranium deposits in the country.

NEW RECORDS IN SCIENTIFIC ACHIEVEMENTS



Zec In The London Daily Mirror

CONGRESS SHAPING A PLAN TO CONTROL ATOMIC ENERGY

Both Houses Grapple With the Bewildering Problems the New Force Has Posed

By ANTHONY LEVIERO

WASHINGTON, Oct. 27—Debate over a national policy for control of atomic energy frothed almost to the point of hysteria during the week. This state of affairs was in vivid contrast with the composure and seeming indifference of the world outside the United States—the people who do not have the atomic bomb.

But if American public opinion was confused and high-pitched and the world masked its curiosity and anxiety, Congress rolled up its sleeves at last. It was set for a hard-headed approach toward a policy to control what is at once a stupendous boon and a great dilemma. Action in Congress, however, was not unmarked by temporizing politics.

Nevertheless, the week-end saw the American system of checks and balances at work on the May-Johnson bill for development and control of atomic energy. Some of the unparalleled powers which the bill would grant to a Government-control commission were being ripped out.

Congressional Controls

If the commission form of control is finally authorized, the commission will undoubtedly receive extensive powers, some of which may prove to be unprecedented. It is acknowledged that the transcendent nature and unknown potentialities of atomic force makes this necessary. Leaders on Capitol Hill predict, however, that when an atomic law is finally passed, the control of fundamental policy will remain, as it invariably does, in the hands of Congress. It is also predicted that the atomic administration will be properly trimmed to a conventional pattern.

Another important stage toward the policy goal was reached in the Senate, which authorized creation of a special Senate committee to study the development, use and control of atomic energy. This legislative body, a comparatively small one of eleven members, will have no other business to divert it from an intensive study of its assigned field.

The dilemma which confronts Congress is one of formulating a set of powers and regulations, far-

reaching yet democratic in application, for control of a phenomena which has been mastered, but which no one really understands. The situation may be likened to that of some ancient intellect that might have conceived in a flash all the complex and fascinating moves of chess, then had to begin the ages-long endeavor of developing the rules by which the game should be played.

May-Johnson Bill

The domestic horn of the dilemma is now receiving the most attention, and this is centered on the May-Johnson bill. Under pressure of attacks from many quarters, the House Military Affairs Committee has held closed sessions during the week, endeavoring to reconcile conflicting points of view.

It was reported that the committee was making substantial changes in the bill, especially some which represent a compromise of scientific and military views. The scientists have clamored for assurance that full laboratory freedom will be permitted. Their position is that in the theoretical field they must be allowed to work unhampered and they concede that the military establishments has a right to keep under wraps the practical and factory application of atomic energy.

As for the international aspects of the atomic problem, there was no sign of a break on Capitol Hill in the prevailing feeling that the United States must keep its secret, at least until counter-measures and controls are developed.

Some legislators believe that the secret should be turned over to the Security Council of the United Nations Organization. Senator Brien McMahon, chairman of the special Senate committee to study atomic control, advocates this and has introduced a bill to implement it.

A modification of this view is put forth by Senator Tom Connally of Texas, chairman of the Foreign Relations Committee and a member of the new atomic energy committee. He would make atomic power available to the Security Council for the maintenance of peace, but the weapon would remain in American hands.

NYT 10/30
Named to Be Director
Of Bureau of Standards



Dr. Edward U. Condon 1937

Special to THE NEW YORK TIMES.

WASHINGTON, Oct. 29—Dr. Edward U. Condon, an expert in the development of the atomic bomb, rockets and radar, today was nominated by President Truman to be Director of the National Bureau of Standards.

In a letter to Dr. Lyman J. Briggs, who is retiring as the bureau's director, the President said his "record has been one of ever-increasing achievement, and you represent an outstanding example of the integrity and competence of government-sponsored science and research."

Scientists Ask International Control of Atom

HT 10/30
300 Experts Who Worked on Bomb Criticize the May-Johnson Bill as Vague

An association of 300 atomic bomb research scientists employed or formerly employed on the Manhattan District project announced yesterday its opposition to the May-Johnson atomic energy act and offered suggestions for a measure which would provide, among other things, for eventual international control of atomic energy.

The group, recently organized as the Association of Manhattan District Scientists, New York Area, made the announcement at its first press conference, conducted by the executive committee at 2 p. m. yesterday at headquarters of the American Institute of Physics, 57 East Fifty-fifth Street.

The scientists' proposals for a new measure, which they plan to submit to Congressional committees at hearings in Washington, include the following: The bill should state that it applies to the control of atomic energy only for the period required for the establishment of effective international control.

Ask Control of Industrial Use

Also, it should provide for Federal regulation of industrial applications of atomic energy, and for establishment of a control commission, with clearly specified powers and duties, composed largely of civilians, including scientists, and "at least several" of the members assigned to full-time administration.

Further, the commission should be allowed to conduct research, in its own laboratories or elsewhere, and should have no power to interfere with purely scientific research and writing not involving military security or to hinder others' work in fissionable materials—such as uranium, thorium and plutonium—as long as the quantities used are not of a size specified in the bill as hazardous to national security.

Dr. Irving Kaplan, one of those engaged in bomb work in the S. A. M. (a project code name) laboratories at Columbia University, and other committee members admitted there were potential dangers in the plan for world-wide dissemination of American discoveries but said the only alternative was "horrible destruction."

Four Objections Listed

Dr. Kaplan also argued that any nation taking an isolationist stand on the matter would be placed at a considerable disadvantage if other nations co-operated. The committee made four main objections to the May-Johnson bill, as follows:

1. The limits and objections are vague. (Likewise, they said, President Truman's Navy Day speech seemed "noncommittal.") The emphasis on secrecy seems to indicate a desire to maintain an American monopoly on atomic-bomb production.

2. The control commission of nine men provided for in the bill would have far too much power and independence, and there are no specifications for their eligibility.

3. The commissioners themselves would serve only part time, and their powers would be discharged by an administrator, or his deputy, who, being removable only by the commission, "would be largely beyond any control whatever, and protected from outside criticism by security regulations."

4. The commission's censorship powers would go far beyond military necessity and would stifle in-

dependent research and retard technological development.

Other members of the executive committee are Dr. Edward Adler, Dr. Francis T. Bonner, Dr. Francis T. Miles, Dr. Richard D. Present, Dr. Charles D. Swartz and Dr. Clarke Williams, all of the S. A. M. laboratories, and Boris A. Jacobsohn and Dr. Maria Goeppert-Mayer, of Columbia University. All except Dr. Adler were at the press conference.



Acme



Associated Press

Atomic experts Szilard and Oppenheimer scoff at plans to keep the bomb secret

there had reason to dispute the man credited with knowing more about the atomic bomb than any other American—Dr. J. Robert Oppenheimer, who until the day before was director of the government's atomic-bomb laboratories at Los Alamos, N. M.

What Science Thinks: Oppenheimer last week spearheaded an invasion of Capitol Hill by atomic-bomb scientists determined to tell Congress their own expert view of atomic-bomb legislation—a virtually unanimous belief that it was pointless for the United States to try to keep the secret to itself and that international control was mandatory.

Before the House Military Affairs Committee, which had been forced by public criticism to reopen hearings on the May-Johnson bill for an all-powerful nine-man commission on atomic energy, and before a Senate committee considering a bill for Federal sponsorship of postwar scientific research, the scientists firmly put forth their views:

☛ Though not opposing the May-Johnson measure, Oppenheimer called discussion of the "secret" of the bomb academic and predicted American attempts at concealment would lead other nations to say: "We will do it without you." And the enemy would not necessarily need the element of aerial surprise, he warned. It would be "technically possible" for an atomic bomb to be secretly planted and detonated within our borders.

☛ Dr. H. J. Curtis, representing scientists at the Oak Ridge, Tenn., project, asserted that there was "no hope of a specific defense against the atomic bomb." He added: "One false move in international diplomacy might mean the virtual destruction of this country."

☛ Dr. Leo Szilard of the University of Chicago made the most specific attack on the May-Johnson bill, declaring its penalties for the revelation of information

would drive scientists away. He asserted that the War Department's release of the Smyth report, with its official disclosure of atomic experiments, had in effect given foreign scientists a complete blueprint for their own research efforts. Szilard bluntly took note of Washington tremors over Soviet atom activity; one report was that Russia has ordered a 300 per cent increase in uranium production in Czechoslovakia. The entire question, he said, seemed to have boiled down to the "dangerous" point of wondering "whether to make the bombs and blast hell out of Russia before Russia blasts hell out of us."

☛ Another assault on the May-Johnson bill as setting up a "potential dictator" of science and offering scientists no real incentive for furthering atomic research came from Dr. Harold C. Urey of Columbia University. Urey disclaimed any thought of a scientists' strike but said: "There are other fields of research that are interesting besides nuclear physics."

☛ Some 50 notable Americans meeting in Dublin, N. H., led by former Supreme Court Justice Owen J. Roberts, went the scientists one better in calling for international control of the bomb. They urged that the United Nations Organization be scrapped as "inadequate" and replaced by a world federal government whose powers, among others, would include control of the bomb and "other major weapons."

Can't Keep It With You

The crowded committee room grew still; eyes turned to the youthful, unassuming witness. Spectators waited tensely for him to answer a question put by Sen. J. William Fulbright, Arkansas Democrat.

Was it true that a single night's atomic-bomb raid on congested American cities could wipe out 40,000,000 inhabitants?

The reply, given casually, was chilling: "I'm afraid it is."

The crowd stirred restlessly. No one

Story of a Buck

The saga of the dollar bill began in 1943 when Sherman (Sam) Baker, a compositor at R. R. Donnelley & Sons Printing Co., in Crawfordsville, Ind., bet another employe, Charles Harmon, that the Army would reject Harmon because of an old hand injury. Baker lost. Cheerfully he handed over a crisp new dollar bill inscribed "Harmon of Donnelley's—

TRUMAN AND ATTLEE WILL MEET NOV. 11 TO DISCUSS ATOMS

U. S.-British-Canadian Parley Expected to Be Devoted Largely to One Topic

M. P. ALLEGES A DEAL

Blackburn Holds Roosevelt and Churchill Reached Agreement —Says Secrets Are Shared

By HERBERT L. MATTHEWS
By Wireless to THE NEW YORK TIMES.

LONDON, Oct. 30—Prime Minister Clement R. Attlee notified Parliament this afternoon of his projected visit to Washington "in order to discuss with President Truman and the Prime Minister of Canada the problems to which the discovery of atomic energy have given rise." He added that Sir John Anderson, chairman of the Advisory Committee on Atomic Energy, will accompany him.

[The White House announced that Mr. Attlee was expected in Washington so that the talks could begin about Nov. 11, news agencies reported.]

There will also be a small group of experts on the same subject. Neither Foreign Secretary Ernest Bevin nor anyone else not associated with atomic research will go with Mr. Attlee, which seems to make it clear that the conversations will be primarily confined to that subject.

However, Winston Churchill, who as leader of the Opposition asked Prime Minister Attlee to make a statement on his trip, later expressed the hope that the talks would not be "limited to any particular topic and that the conversation will range freely over everything that can conduce to the closer amity, intimacy and understanding between the two great English-speaking countries."

Questioned About Russia

Two Labor M. P.'s pressed Mr. Attlee to say whether Russia was not going to be invited to the discussions, but the Prime Minister said it would be better to have the Washington conversations first and to "take these things by stages."

Capt. A. R. Blackburn, Laborite M. P., who has been leading a large group of Leftist Parliamentarians in an effort to break down atomic secrecy, made another important attack this evening, saying it was apparent that President Roosevelt and Mr. Churchill had come together "in deadly secrecy" in Quebec on that subject but leaving the peacetime development very much to the discretion of the United States.

"I would ask the Prime Minister to bring this secret agreement to the light of day at the earliest possible moment," he said, "contrary to what President Truman might have led some people to suppose, our scientists are, in fact, in possession of every detail of the manufacture—every secret—in short, the whole technical 'knowhow' of the atomic bomb."

Captain Blackburn also asked in the House of Commons why President Truman did not concentrate on the cheap production of atomic energy that would transform the world. Said Captain Blackburn:

"If by building bombs instead of ending man's drudgery the President thinks he is discharging the sacred trust, he must be mistaking Lucifer for the Almighty."

At that point Sir Patrick Hanon, Conservative, cried, "No, no."

"I am quite sure the President is animated by the highest possible motives," Captain Blackburn hastily remarked.

"Why I said, 'No, no,'" Sir Patrick added, "was that I do not think there is any precedent for this House making a comparison between the President of the United States and the Almighty."

Secrecy Worries British

It is the problem of secrecy that primarily worries certain British circles, although apparently not the Government nor British military quarters. Low's cartoon in today's London Evening Standard shows Stalin rubbing his chin dubiously and Attlee with a quizzical expression eyeing him while a smiling Truman holds out a paper in his left hand headed, "The Twelve Points" and firmly grasps under his right arm a missile labeled, "Atom Bomb, Private."

Tomorrow morning's Times of London will come out flatly for turning the atomic secret over to the Security Council of the United Nations Organization.

Those who agree that the secret should be kept—and they constitute by far the most influential body of opinion here—worry principally over whether the Americans intend to keep even the British out of the picture. This group would like to see atomic manufacturing turned into a sort of extraterritorial or intranational procedure of the United States, Britain and Canada.

Replying to the debate, Herbert Morrison, Lord President of the Council, said that in view of the Prime Minister's forthcoming visit to the United States he could not give the House a comprehensive statement. The foreign policy aspects of atomic energy are "terrific," he said.

"Therefore, if we cannot make up our minds in five minutes on the way out of these problems we cannot be blamed for that," he said. "We have to wrestle with this headache and think out policies whereby this new invention, instead of becoming a dangerous menace to all nations and possibly even to an international security organization itself, we have to consider how we can tie this up with foreign policy and the organization of security or take steps whereby no one is likely to use it."

Meeting to Begin Nov. 11

Special to THE NEW YORK TIMES.

OTTAWA, Oct. 30—In announcing the forthcoming visit to Washington of Prime Minister Attlee and Premier William L. Mackenzie King, Justice Minister Louis St. Laurent told the House of Commons that the calling of this conference had compelled Mr. King to forego his intention of visiting the Canadian troops stationed in Germany and the Netherlands and of seeing Europe.

Mr. King, the Minister said, was dealing with all arrangements relating to his own and Mr. Attlee's visit, and he had no doubt that consideration was being given to the possibility of Mr. Attlee's visiting Canada and addressing Parliament here.

It is not yet decided when Mr. King will return, but it is expected that he will come to Ottawa before the Washington meeting, which is scheduled to begin on Nov. 11.

In making his announcement Mr. St. Laurent called attention to the President's message to Congress of Oct. 3, in which he forecast this "intimate discussion first with Great Britain and Canada and then with other nations, in an effort to effect agreement on the conditions under which cooperation might replace rivalry in the field of atomic power."

RUSSIA CONFIDENT ON BOMB

Soviet Scientists Have Long Studied Atomic Fission

MOSCOW, Oct. 29 (U.P.)—Russia is confident her scientists will develop the atomic bomb indepen-

By OLIVER PILAT

Post Staff Correspondent

Washington, Oct. 30—With some concessions to scientists who want fewer restrictions on their right to experiment, the May-Johnson bill for an atomic energy commission was reported out today by the House Military Affairs Committee.

They are, if they have not already done so, it may be reported today on the basis of discussions with several prominent Soviet scientists. Observers have the impression that the Russians are considerably less concerned over the atomic bomb than reports have indicated.

Soviet scientific literature fully discussed atomic fission for many years before the war. Foreign scientists attending sessions of the Academy of Sciences last summer were impressed by the enormous strides that Soviet physicists and chemists have made and are making.

Given this proficient scientific organization, the Soviet Union's rich resources, including uranium deposits, and the unlimited funds that the State can devote to research purposes, it is not believed that Russia can lag in atomic research.

The magazine Prioroda, organ of the Academy of Sciences, went to press in early June before President Truman announced the use of the atomic bomb. But it contained a full discussion of the problems of atomic fission. A long, technical article discussed the history of Soviet research and outlined the possibilities of fission.

Soviet scientists were certainly aware of the general progress made abroad. It would be highly surprising if they were caught napping, observers believe.

The weapon is so terrible, they suggest, that it may never be used again in warfare, since it could neutralize or destroy all conflicting powers. These Russians point out that belligerents in this war all had full knowledge of poison gas, but refrained from using it.

CHURCHILL, ATTLEE CLASH

Ex-Prime Minister Asks Data on British Army Dispositions

LONDON, Oct. 30 (P)—Winston Churchill and Prime Minister Attlee clashed in Commons today over the question of how many British soldiers still were being held in Britain, Europe and Eastern Asia. Mr. Attlee refused to answer Mr. Churchill's request for information on the disposition of Army and RAF personnel on grounds that "it is not in the public interest."

There were cries of "Oh" and the former Prime Minister shouted:

"I am astounded at the answer which has been given by the Prime Minister. I do not for one moment accept the validity of the argument that rests behind it."

Mr. Attlee then suggested a conference later with Mr. Churchill to discuss just what figures could be disclosed. Mr. Churchill accepted.

Mr. Churchill said his object was "to get the largest number of men out of the Army I can."

Dr. Urey Excoriates Atom Bill

Dr. Harold C. Urey, Nobel Prize winner and one of the Columbia University scientists who helped develop the atomic bomb, told a group of 100 scientists last night at Columbia University that the May-Johnson bill, which was reported out of committee in the House of Representatives yesterday, was the "first totalitarian bill ever written by Congress." "You can call it either a Communist bill or a Nazi bill, whichever you think the worse," Dr. Urey said. Dr. Urey charged further that the spirit of the bill was military and would hinder rather than help the United States in world negotiations.

The measure may reach the House floor for debate next week.

Though hearings on the Army-sponsored measure were terminated over the protest of many scientists and educators, who want a full exploration of the whole subject of atomic energy, objections of witnesses who did testify were reflected by minor changes in the bill.

Scientists were guaranteed free experimentation, provided they did not go to work on a scale "which would constitute a national hazard."

Penalties Cut

Penalties for violation of regulations or safety rules of the commission set up in the bill were scaled down from \$100,000 fine and 10 years in prison to \$10,000 fine and five years in prison.

The basic, much-criticized setup of the commission, nine part-time men appointed by the President with Senate approval, was retained. The commissioners would receive \$50 a day when they worked. Day to day operations would be left to a \$15,000-a-year administrator and a deputy administrator earning \$12,000.

Administrator Limited

Many witnesses complained that actual power might fall to the administrator, appointed by the commission. The committee wrote in a phrase that the administrator could make no major decision without specific commission approval.

The committee also wrote in an amendment that the commission must conform to U. S. foreign policy. General emphasis on the commission as solely a domestic arrangement for controlling atomic energy research, development and manufacture was retained in the revised bill.

The committee vote to report out the measure today was said to be 17-10.

WAR BAN IS URGENT, 515 SCIENTISTS SAY

Unprecedented World Pattern
for Amity Only Defense for
Atom Bomb, Radar Men Hold

By WILLIAM M. BLAIR
Special to THE NEW YORK TIMES.

CAMBRIDGE, Mass., Oct. 30—Five hundred and fifteen scientists, asserting that no effective defense was possible in atomic warfare, called today for "international cooperation of an unprecedented kind" to assure survival of the human race.

In a statement urging that the development and production of atomic energy be brought under effective international control, the physicists, chemists and engineers, who have been engaged in war research at Harvard and the Massachusetts Institute of Technology, declared:

"If the people of the world are to survive, it is necessary for the United States Government, as first producer of the [atomic] bomb, to initiate immediately steps to achieve effective world cooperation for the prevention of war."

They asserted that traditional methods of international policy had been unable to prevent war and contended that to perfect new methods of international cooperation "national sovereignty in its traditional form will have to be sacrificed."

The scientists made no attempt to outline a plan for the international control of atomic energy or for a world organization, although spokesmen admitted that the crisis that they believed the world faced had forced them into the field of political action.

Views of Radar Experts

The statement was modeled on previous declarations of other groups of scientists, notably those at Los Alamos, N. M., and others who perfected the atomic bomb. The chief difference, however, was that the statement was prepared by experts in radar, the present major defense mechanism against attack.

These experts declared flatly that the physical principles involved in the atomic bomb made it clear that "a complete defense is absolutely impossible."

Spokesmen explained that the experts' purpose was to "alert the American people and the Government to the terrible consequences of an armament race with atomic weapons."

The statement was adopted in final form by a vote of 175 to 1 at a meeting here Oct. 23. The lone dissenter was not identified. During the last week several hundred endorsements were received from scientists who could not attend the meeting.

Attached to the statement were two memoranda on defense against atomic explosives and how an atomic bomb might be delivered.

Dr. I. A. Getting, a division head of the M. I. T. radiation laboratory, who worked on nuclear physics at Harvard before the war and is regarded as an outstanding radar fire-control expert, answered the question whether there was a possible defense against missiles carrying atomic explosives. He declared:

"The answer is, 'the possibility of making an adequate defense against atomic missiles is so vanishingly small as to be zero from any practical viewpoint.'"

Ridenour Gives Theory

Dr. Louis N. Ridenour, Professor of Physics at the University of Pennsylvania, an expert on guided missiles, said in discussing the method of atomic bomb attack:

"Of two principal classes of means for using the atomic bomb, the first, and overwhelmingly the most important, is the infernal machine, or mine, which has been located in operating position during peacetime."

"The tremendous importance given the infernal machine by the development of atomic explosives has scarcely been appreciated in public statements so far made on atomic warfare and the military and Navy establishment needed to take part in it," he added.

Other conclusions in the scientists' formal statement were that other nations would be able to produce atomic bombs, that safety could not be obtained by superiority in atomic armament and that henceforth war would mean the destruction of a large part of civilization.

"Winning" a Nuclear Armament Race

NT Scientists Warn Against Dangerous and Misleading Half-Truths 10/30

ACCORDING to a recent newspaper column a high government official has said that a nuclear armaments race is under way. Further, the official believed that the United States can "stay ahead" in the race—we can produce more bombs, better bombs, bigger bombs than any other country.

In the long run no country can "win" a nuclear armaments race. It is for this reason that the undersigned scientists, who are familiar with the technological and scientific details of plutonium manufacture, repeat a warning that they have already given many times: In an atomic war the overwhelming advantage lies with the aggressor. Possession of twice as many atomic bombs as the aggressor is worthless; they will not bring to life the many millions of people who would be killed by several dozen bombs. Nor is it even likely that a country which suffers such an appalling catastrophe in one raid would be able to launch an effective counter-attack.

Because of its inconceivably large destructive power, rather few atomic bombs can be decisive against even a big country. Nuclear armaments, unlike all others, therefore show the phenomenon of saturation. There is little point in manufacturing three times as many bombs as are needed to destroy, say, one-third of the enemy's population. A nuclear armaments race must therefore lead eventually to a state of affairs in which several nations are saturated with atomic bombs. Some nations, such as ours, will saturate earlier; others, which are less highly industrialized and cannot afford such large installations, will saturate later. Eventually all contestants in the armaments race have reached saturation; the race in fact ends in a tie, even though some may have more or better bombs than others. To imply that "staying ahead" in the race gives ultimate security is misleading and dangerous.

When saturation in nuclear armaments has been reached it is as

though two men (who don't trust each other) sit face to face in a locked room, each pointing a loaded machine gun at the other. It makes little difference that one man's gun is a later model, or that he has 1,000 cartridges to the other's 100. Whoever shoots first wins decisively.

That every nation, once it succeeds in developing atom bomb know-how, eventually ties in a nuclear armament race, and therefore no single nation will "win" such a race, seems evident to us. There remains the question, will all of the great powers develop this know-how and the industrial installations to back it up? There is no reason to believe that at least England, Russia, and probably France will not be able to manufacture bombs soon.

England certainly has know-how. The scientific part of the atomic-bomb project was a joint enterprise in which English and Canadian scientists played an important part. Already in Canada there is a pilot plant which will produce plutonium. As for raw materials, the Great Bear Lake uranium ore deposits in northern Canada are among the world's greatest.

France certainly has scientific know-how. Several of the key men in the Canadian project were French emigres who have since visited or returned to France. These men may be presumed to know enough to reproduce with very little effort at least the Canadian pilot plant. France does not have much uranium ore; but Belgium owns enormous deposits in the Belgian Congo. A coalition of France and Belgium has all that is needed to build a plutonium plant.

About Russia we know less. What is known for certain is that the Russians have large uranium ore deposits. Also, the theory of the slow neutron chain reaction (which is used to produce plutonium) was published in Russian scientific journals in 1942. The principles underlying the atomic bomb were published even earlier. Certainly Russian physicists like Kapitzka, Joffe, Landau, Tamm, to mention a few, are as competent as physicists anywhere in

the world. To assume that they can not reproduce on a scientific level what was done here by a group which was about equally competent is dangerous. On a technological level it is similarly misleading to assume that a country which built the best tanks of World War II can not compete with us—especially when successful competition means, not to build as many bombs as we do, but, simply to build to saturation.

The enormous cost of the atomic bomb, \$2,000,000,000, is given by those who believe we can "stay ahead" in the race as proof that other countries can not compete with us. Such a statement is a half-truth which leads only to confusion. In the first place, can we assume that Russia, at least, realizing the stakes involved, would be deterred from building atomic bombs because of their cost? In the second place, the figure of \$2,000,000,000 is entirely misleading. Four processes, all of which work, were used to separate U-235 and to manufacture plutonium. According to officially released figures, the plutonium plant at Hanford cost only \$400,000,000. Of this a fair fraction went into the construction of the towns of Richland and Hanford. The \$2,000,000,000 therefore represents, not what atomic bombs need to cost, but rather, what they happened to cost us because we had to try several methods for fear that some would not work.

The stark reality of the atomic bomb is here to stay. We can not afford to shy away from the reality. We can not afford misleading half-truths about it. When misinformation about the atom bomb stems from high authority, it constitutes a danger of the gravest sort. As American scientists who are in a position to evaluate the accuracy of technological statements concerning the bomb and its production, we urge that we be heard, and that our counsel be considered in this transcendently important matter.

AVIN M. WEINBERG
PAUL C. TOMPKINS
RAYMOND W. STOUGHTON
KURT A. KRAUS.
Oak Ridge, Tenn., Oct. 27, 1945.

All Services Back Air Force Against Atom

HT 10/31
Experts Tell Congress Next
War Will Not Be Fought
by Push-Button Missiles

WASHINGTON, Oct. 30 (AP).—Military experts rejected today any idea that future wars will be waged by a few men controlling pilotless atomic missiles with push buttons.

They told Congress this nation's defense must be based on a powerful air force because "at the present time, the atomic bomb is considered an adjunct of air power rather than a substitute for it." The appraisal was made by experts of the War, Navy, State and Commerce Departments in a report to a subcommittee of the Senate Military Affairs Committee.

The report said aircraft will continue to play a "major role in the control of the skies, observation,

carrying destruction to the enemy, and especially in transporting men and supplies."

It warned that defense must be based upon the "premise that this country will be the first target of attack and that we will not have any major allies for at least the early period of the future war."

Any aggressor would know that it is "essential to attack and destroy the industrial resources of this country before they can be mobilized," the experts said.

The experts advised that the nation retain at least one-fourth of the aircraft industry's war-time plants.

They suggested that military aircraft factories be dispersed in half a dozen places in the interior of the country to minimize the danger from long-range bombers, carrier-based planes and rockets.

They offered the following "rough estimates" on post-war annual production of aircraft:

Private planes: 20,000 to 45,000, costing \$72,000,000 to \$120,000,000.

Commercial transports: 324 to 475, costing \$125,000,000 to \$175,000,000.

Military aircraft: 3,000 to 5,780, costing \$750,000,000 to \$1,400,000,000.

Harvard Puts \$425,000 In Nucleus Physics Plan

Also Recalls Its Cyclotron for
Atom-Smashing Work

CAMBRIDGE, Mass., Oct. 30 (AP).—Harvard University today announced an appropriation of \$425,000 to broaden research in nuclear physics, the branch of science which helped develop the atom bomb.

The five-year program also calls for return of the Harvard cyclotron from Los Alamos, N. M., where it played an important part in the Manhattan Project, for additional atom-smashing work.

Dean Paul H. Buck, provost of the university, will head a new committee of representatives of allied fields of scientific research. The other members have not been announced. The financial appropriation may be used for buildings, equipment or salaries.

The university also elected three new associate professors of physics, all trained in nuclear research. They are Robert Rathbun Wilson, formerly assistant professor of physics at Princeton, who helped evolve the atomic bomb; Julian

Seymour Schwinger, formerly assistant professor of physics at Purdue University, and Edward Mills Purcell, former tutor in Harvard's department of physics.

9-Man Control On Atom Voted In Committee

House Gets Diluted Version of the May-Johnson Bill, Voted, 17-10, Thursday

By Robert E. Nichols

WASHINGTON, Oct. 30.—Nine-man control of all atomic energy development in this country and plans for keeping the atom bomb a national secret were proposed today by the House Military Affairs Committee, despite protests against national control from the Congress of Industrial Organizations and the Association of Manhattan District Scientists.

Meanwhile, the White House disclosed officially that Prime Ministers Clement Attlee of the United Kingdom, and MacKenzie King of Canada, would arrive in Washington within two weeks to confer with President Truman on international problems arising from development of the atomic bomb.

Culminating more than three weeks of discussion and study, the House committee indorsed a somewhat diluted version of the May-Johnson atomic control bill after describing it as an interim measure. The revised bill, approved by a 17 to 10 vote, will be reported to the House for debate on Thursday, Chairman Andrew J. May, Democrat, of Kentucky, said tonight. Mr. May said the committee favored the United States' retaining the secrets of harnessing nuclear energy "until the world's diplomats develop a better harness for international affairs."

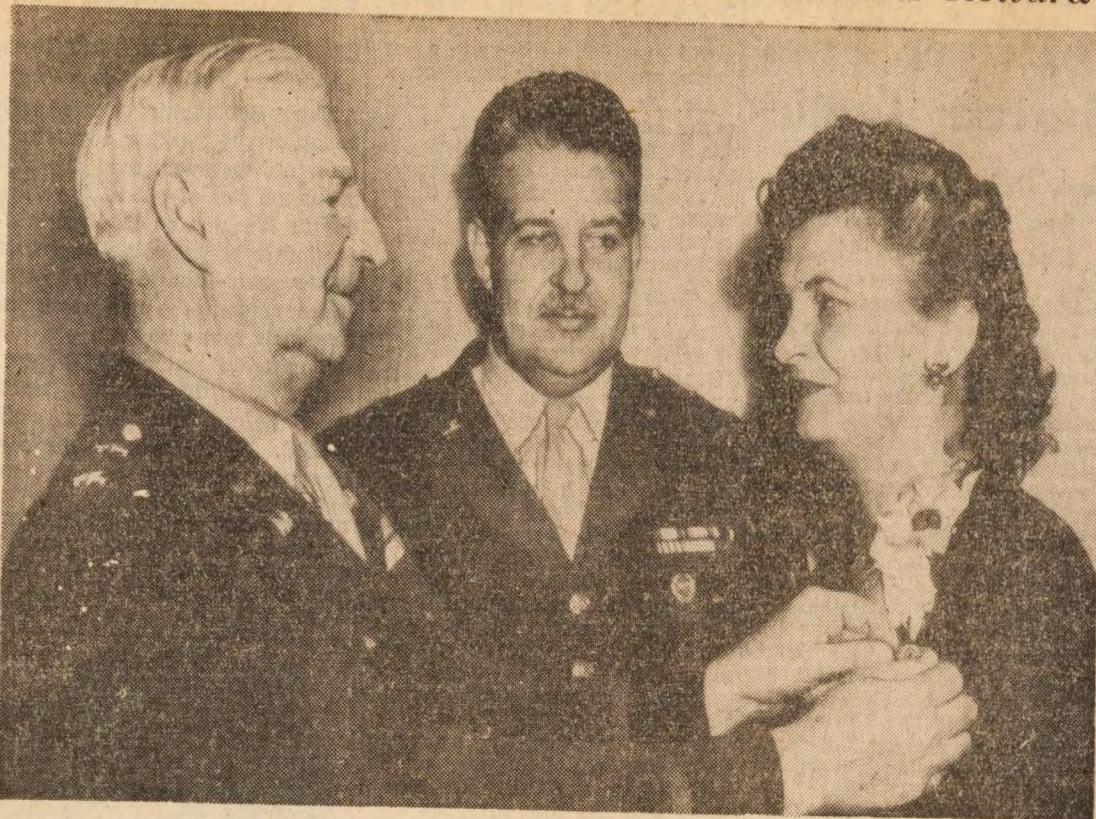
The nine-member commission would have general supervision over all activities in the field of atomic energy, be empowered to acquire by condemnation and eminent domain all mineral deposits and other properties used to develop atomic energy, but could not deal with foreign interests or individuals without express approval of the President.

The nine commissioners would be appointed by the President and confirmed by the Senate. They would receive \$50 for each day of work actually performed, plus expenses. Detailed work would be handled by a \$15,000-a-year administrator and a \$12,000-a-year deputy, neither of whom could take any major action without commission approval.

Prime Minister Attlee's forthcoming visit was expected to bring more pressure for international rather than national control of atomic energy. Announcement of the meeting here was timed to coincide with formal disclosure of the plan to the House of Commons in London.

Neither the White House nor London announcement mentioned Russian participation in the Washington conference.

Woman Who Kept Secret of Atomic Bomb Gets Reward



Major General Leslie R. Groves (center), commanding officer of the Manhattan Engineering District (the atomic bomb project), watches Major General Thomas M. Robins pin the Exceptional Civilian Service Award on Mrs. Jean M. O'Leary, his assistant, at the War Department yesterday

Associated Press wirephoto

From the Herald Tribune Bureau

WASHINGTON, Oct. 30.—The woman who kept her mouth shut about the atomic bomb until the world knew of its existence was the recipient of a medal today, not only for keeping the secret but also for her efforts in making the experiment a success. She is Mrs. Jean M. O'Leary, of Newark,

N. J., administrative assistant to Major General Leslie R. Groves, commanding officer of the Army's "Manhattan Engineering District," code name for the project. General Groves watched the pinning of the Exceptional Civilian Service Award on his blonde assistant at a surprise ceremony in his office today. The highest civilian decoration

bestowed by the War Department, it was presented to her because "her able leadership, sincere enthusiasm and untiring zeal contributed materially to safeguarding the security of this vitally important project." Mrs. O'Leary knew the atom bomb secret from the beginning and frequently visited the plants connected with its manufacture and assembly.

More Scientists Demand Steps to Ban Atom War

515 on Harvard-M.I.T. Project Ask International Action

Special to the Herald Tribune

CAMBRIDGE, Mass., Oct. 30.—

The growing list of scientists seeking to make clear their position on atomic energy and the atomic bomb was augmented again today by 515 physicists, chemists and engineers who were employed on war research at Harvard University and Massachusetts Institute of Technology.

The group issued a "Statement on International Control of Atomic Energy." Its signatories were headed by Professor E. W. Bridgman, Harvard's leading physicist; I. A. DuBridge, head of the physics department at the University of Rochester and director of the radiation laboratories at M. I. T.; Professor H. L. Hazen, head of the electrical engineering department at M. I. T.; Professor F. W. Loomis, head of the physics department, University of Illinois; Professor Louis A. Turner, of the physics department at Princeton University; Professor G. E. Uhlenbeck, of the physics department at the University of Michigan; Professor J. H. Van Vleck, head of the physics department at Harvard; and Professor A. T. Waterman, of the physics department at Yale University.

The statement made five points, saying in summary, "Specifically

our conclusions are: (1) Other nations will be able to produce atomic bombs; (2) No effective defense is possible in atomic warfare; (3) Safety cannot be obtained by superiority in atomic armament; (4) Henceforth, war will mean the destruction of a large fraction of civilization; (5) International co-operation of an unprecedented kind is necessary for our survival."

It seems that one of the characteristics of atomic energy is that it frightens most those who possess it. The United States, being in the saddle but having not the slightest desire to ride, is far more nervous about the bomb than are the countries that do not yet know the trick and are merely engaged in finding it out. These unatomic countries have something to occupy their hands and their minds, some logical goal. We in America have reached the goal, and nobody knows which way you turn after you have learned how to destroy the world in a single night. It's hard to know, Weintraub—you who fought well and in a great cause.

New Yorker, 11/3

THE ATOMIC SCIENTISTS SPEAK UP

NUCLEAR PHYSICISTS SAY THERE IS NO SECRECY IN ATOMIC BOMB AND NO DEFENSE AGAINST IT

by DR. DAVID L. HILL, DR. EUGENE RABINOWITCH and DR. JOHN A. SIMPSON JR.

Scientists always have preferred to see the results of their studies used for constructive rather than destructive purposes. More than anybody else, they have been aware of the fact that man's control of the forces of nature, if rationally exploited, can provide all nations with ample livelihood and make wars for raw materials, markets and other economic assets a thing of the past. However, scientists have not heretofore felt that it was their responsibility to fight for this rational use of the products of their endeavor. This responsibility they willingly left to the governments of their nations.

There are two reasons why the present attitude of the scientists is different. In the first place, never before have they been so clearly responsible for new forces of destruction unleashed upon the world. The development of the atomic bomb was the result of the initiative of prominent scientists, who succeeded in persuading rather reluctant authorities that nuclear physics contained undreamed-of military potentialities. Had they not succeeded, we would still be living in the quaint old world of blockbusters and rocket bombs. In the second place, the advance embodied in the atomic bomb is of a different order of magnitude from the discoveries of gunpowder, dynamite, poison gas or radar. The atomic bomb is the first practical step of mankind out of the old world—which we may call the world of electronics—into the world of nucleonics. Electronic forces are responsible for all the chemical and electrical processes in our bodies as well as our power plants, engines and rockets. Nuclear forces are responsible for the life and death of the stars. They are so much stronger that they hold the nucleus of an atom together in a volume infinitely smaller than that in which the electronic forces hold the atom as a whole. If the atom were the size of the U. S. Capitol dome, its central nucleus would be the size of a pinhead.

The scientists do not aspire to political leadership but having helped man to make the first step into this new world, they have the responsibility of warning and advising him until he has become aware of its perils as well as its wonders. They have lived with the secret of the atom bomb for several years; they thought about its future and its implications for mankind long before the rest of the world had become aware of the problem. It is their duty, conscious as they are of the danger which atomic power

In the conviction that scientists retain a moral responsibility for the ends to which their discoveries are applied, some 800 U.S. scientists were endeavoring last week to impress upon the nation their views concerning the future of the atomic bomb. Their opinions were directed most immediately at Congress, which is considering the May bill on government control of all atomic-energy use and research (see Editorial, p. 36). In the vanguard were the atomic scientists of Chicago, comprising most of the scientists attached to the Metallurgical Laboratory of the University of Chicago, a part of the so-called "Manhattan District" under which the atomic bomb was developed. LIFE herewith presents a statement which was composed by three members of this group. The authors—Dr. David L. Hill, experimental physicist; Dr. Eugene Rabinowitch, physical chemist; and Dr. John A. Simpson Jr., nuclear physicist—prepared their statement at the direction of the executive committee of the atomic scientists of Chicago with the belief that it represents the views of the vast majority of the members of this organization.

brings to mankind and, first of all, to their own nation and their own families, to carry the warning of this danger to all the people of our country and to all the other nations on earth. They must persuade all political and social groups in the country that here is a threat to the very existence of us all—a problem of survival which cannot be postponed or disposed of by wishful thinking or the application of old political formulas.

One of the fields in which we must revise our old opinions is that of national security. Let us consider the popular arguments and attempt to answer the usual questions about the role of the atomic bomb in national defense.

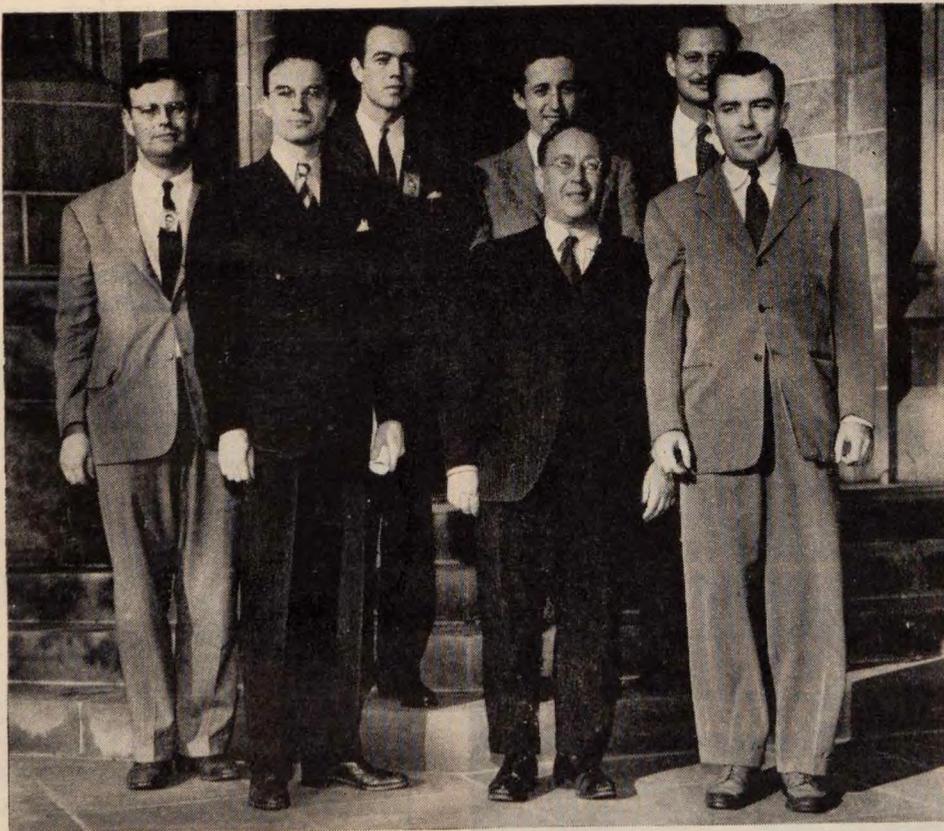
1. Can we keep the secret? To many imaginations, the atomic bomb appears as a "secret formula," which a traitor can slip to a spy in a dockside tavern or a heroic scientist can swallow

just before it is snatched from him by foreign villains. The fact is that a fundamental secret of the atomic bomb simply does not exist. If Hitler had prevented the publication in 1939 of the first papers on atomic fission, Germany might have remained for a certain period of time in exclusive possession of a true fundamental secret of atomic power. It is the good fortune of the world that this did not happen and that the basic scientific facts were in the possession of all scientists when the war started.

Only the U.S. has had enough spare scientific manpower, technological equipment and security from interference by the enemy to venture into a large-scale industrial utilization of these facts. For others, they remained phenomena only known from observations on a laboratory scale. Until the first bomb was dropped, scientists in other countries could not be certain that an attempt to go from laboratory experiment to large-scale production of atomic explosives would not encounter insurmountable technical difficulties. The explosion at Hiroshima has answered these doubts. It has revealed the most important of our "atomic bomb secrets."

The official releases of our War Department and of the British government have mapped out several different processes which we have used with success in the preparation of atomic explosives. Our governments have not revealed important details of the technological procedures used. We have kept for ourselves the actual blueprints of the plants and much of the quantitative information on which industrial procedures were based. We gave only a vague idea of the methods by which the atomic explosives are actually detonated in the bomb. These are the "secrets" of the atomic bomb which still remain in our possession. None of these, however, can be called the secret of the bomb. In competition between two rival companies, knowledge of technological details might be of decisive importance. But we have to face the competition of whole nations. They will concentrate on this problem their best scientific and engineering manpower and give it unlimited material support.

They will not need to repeat the extensive program which we have undertaken—the simultaneous development of several processes to insure us against the failure of any one of them. Instead, they will be



Atomic Scientists. First row (left to right): the authors of this article, Dr. David L. Hill, Dr. Eugene Rabinowitch, Dr. John Simpson Jr., all of the University of Chicago. Back row: Dr. Charles Coryell, Dr. Spofford English, Dr. Harrison Brown, all of Oak Ridge; and Dr. Nathan Sugarman of Los Alamos.

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ATOMIC SCIENTISTS CONTINUED

able to concentrate on the process most suitable to their resources, since they know from us that any one of them can be carried out successfully. Consequently, they will need only a fraction of the scientific manpower and industrial know-how which we have invested in the bomb.

It took us three years to achieve the transition from the theoretical realization of the possibility of making an atomic bomb to its actual production. It would be extremely unwise to assume that others will require much more time now that the path has been mapped out by us. Let us realize the fact, however disagreeable, that in the near future—perhaps two to five years—several nations will be able to produce atomic bombs.

2. Can we monopolize the raw materials? A possible way to monopolize atomic bombs is to control the raw materials necessary for their fabrication. Primarily, this means control of the uranium ores. The worldwide distribution of uranium ores does not permit us to achieve this control except by conquest. Canada and Belgium control the most important deposits known before the war. Czechoslovakia has the famous old St. Joachimsthal mines; before the war Russia was known to produce considerable quantities of radium, which is made from uranium ore. New deposits undoubtedly have been discovered since and others will be discovered when intense prospecting spreads over all the areas of the globe. It would be foolhardy to rely on the assumption that we alone—or together with Britain—can deprive the rest of the world of access to enough uranium for the production of atomic explosives.

3. Would it not be enough for us to retain leadership in atomic developments? We do not argue against the maximum development of atomic-power research and its applications in this country, but we want to warn against assuming that this can provide us with lasting security. A race in atomic armaments is different from armament races in naval vessels, guns or airplanes. The latter weapons are intended to combat each other: therefore, one side can maintain its lead indefinitely, for example, by building two battleships whenever the other side builds one. Atomic bombs are weapons used only against large cities and industrial centers. Therefore, if both sides in a conflict have enough atomic bombs to wipe out each other's cities, they are in approximately equal position, even if the one has three times more bombs than the other.

The industrial potential of our country, which was decisive in winning World War II, will not count for much in a future atomic war. Since the result of the conflict may well be decided in the first hour, it will be decided not by the size of the accumulated stock of bombs nor by the capacity to increase it after the beginning of the war, but by the suddenness of the attack and the placement of atomic bombs in locations from which they can reach their targets with minimum delay and loss.

On all these counts, a peaceful, democratic, highly industrialized country, with a long shoreline and a large proportion of its population concentrated in comparatively few metropolitan centers will be at a great disadvantage.

4. Will fear of retaliation prevent atomic warfare? To realize what situation we would face in a world where the main deterrent to atomic bomb attack will be fear of retaliation we have only to use our imagination. In order not to leave the results of attack (or the success of retaliation) to chance, the nations bent on securing maximum advantage in a possible "one-minute war" of the future may seek to substitute preventive mining for bombing from the air. Thus, each nation will live in the apprehension that its cities, factories and naval bases may be mined during peacetime and blown up when an aggressor decides to strike. This action may be precipitated by the belief that only by striking first can a nation prevent an aggression against itself.

Not only will the actual possibility of sudden atomic attack or of preventive mining be important, but the fear of it will inevitably cloud international relations and create panic in every period of international tension.

A world in which atomic weapons will be owned by sovereign nations, and security against aggression will rest on the fear of retaliation, will be a world of fear, suspicion and almost inevitable final catastrophe.

5. Is a defense against the atomic bombs likely? In the past, a not entirely adequate defense could be improved, or a new one invented, after the attacker had revealed his weapons of aggression. No opportunity for perfection of defensive weapons will be given in the case of atomic bomb attack.

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No specific defense against the bomb itself—*i.e.* a device which would explode them before they reach their targets—is in sight. Irresponsible claims that such a device has been invented only stimulate wishful thinking.

The only possible defense is against the bomb carriers. But since bomb-carrying planes might be sent by an enemy without a preliminary declaration of war, there is no defense against them short of complete cessation of all peacetime international air traffic. Of rockets loaded with atomic explosives a number will always come through, since no radar or similar device can be expected to protect a whole continent against projectiles which may arrive at any time, from any direction, including the stratosphere.

The most efficient defensive measure that a single nation can adopt is to disperse its industries and population centers. A determined enemy, however, would need only to accumulate a correspondingly larger number of atomic bombs in order to make this form of defense inadequate. The conclusion cannot be avoided that in the atomic age it will be difficult if not impossible for any one nation, big or small, to make itself secure against a crippling attack.

6. Can atomic warfare be outlawed? In the light of the disarmament agreements of the 1920-30 era, the Kellogg Pact for the outlawing of war and similar experiments, no nation in the world is likely to entrust its future to an international agreement, however solemnly proclaimed, which would banish atomic warfare but leave the fulfillment of this pledge to the conscience of the signatories. No agreement on restriction or complete abolition of atomic armaments can be considered as of real importance if it is not supported by an efficient control against evasion.

The only real alternative to a headlong race of mankind toward complete destruction of our present civilization appears to be the establishment of effective international control over the production of atomic bombs everywhere. Not only must the bombs be outlawed by international agreement, but an authority must be established capable of controlling the way in which the individual nations are carrying out this covenant.

An attempt to do so will create new problems, some of them unprecedented in the history of relations among nations. These problems will have to be thoroughly explored before an intelligent long-range policy for the U.S. can be mapped, either in its foreign relations or its domestic affairs. The associations of scientists at Chicago and Oak Ridge have therefore gone on record as opposing any legislation concerning atomic power until a thorough congressional inquiry into all its aspects has been conducted. An intelligent and stable policy can be based only on adequately informed public opinion and can be formulated only by a Congress fully aware of all the novel and complex implications of the new era.

The scientists are often asked: What about the peacetime applications of atomic power? These, too, will depend on how successfully the specter of atomic warfare is banished from the earth. We may look confidently to benefits which the production of new radioactive elements will bring to science, industry and medicine, since small-scale atomic plants will be sufficient to provide an abundance of these invaluable tools for scientists, doctors and engineers. On the other hand, only in a world free from fear of war will it be possible to give full freedom to the development of large-scale atomic-power projects.



Japanese idol grins amid the ruins of Nagasaki. In the single blast of atomic bomb, 26,000 people were killed and 40,000 were wounded; 18,000 buildings were destroyed.

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Oct 45

THE PHYSICIST RETURNS FROM THE WAR

by I. I. RABI

1

NEARLY five years ago, on November 6, 1940, I left my laboratory and classroom at Columbia University to work with a number of other physicists from different parts of the country on the secret development of new weapons of war. Before this paper appears in print, thanks largely to the "atomic" bomb, I hope and expect to be back in my laboratory and, together again with students and colleagues, to resume a life project which was interrupted by "a call to armaments."

Before the war these physicists almost never had occupied themselves with problems and questions which in any direct way could be called immediately practical. They directed their whole attention to discovering and understanding the laws of the physical universe in a clear, consistent, logical, and often mathematical scheme. They made it their code to communicate these results to others in the most frank, direct, and expeditious manner. Inseparably connected with their scientific work — and no small part of it — was the upbringing of future scientists.

Yet these very men were largely responsible for the discovery and practical development of at least two of the most remarkable and terrible weapons of this war: radar and the so-called atomic bomb. To apply the adjective "terrible" to radar may occasion some surprise to those who only have read or thought about electronic devices in terms of their beneficial peacetime applications. The crews of Japanese ships, however, who found themselves being shelled with devastating accuracy during the darkest hours of night by our warships, and the Germans who experienced saturation bombing from airplanes which were invisible above a dense cover of clouds, will readily testify to the weird and uncanny terror which an

unseen but deadly enemy can inspire. The potentialities of this extraordinarily facile and protean instrument of war are disquieting to anyone who appreciates the degree to which radar will heighten the surprise value and accuracy of any weapon.

Speaking for the group of men who created these weapons, I would say that we are frankly pleased, terrified, and to an even greater degree embarrassed when we contemplate the results of our wartime efforts. Our terror comes from the realization — which is nowhere more strongly felt than among us — of the tremendous forces of destruction now existing in an all too practical form. By this, I do not mean to suggest that we who helped to create the new weapons are now overcome with a sense of guilt or regret. These instrumentalities were natural consequences of the scientific knowledge at our disposal, and as such were inevitable. They did help us to win a bitter war in which we were attacked in a most cowardly fashion.

Returning from wartime occupations to his laboratory and classroom, the physicist looks forward to an era of peace and regards anew the future of his science. From the lessons of this war, we know that his science, as he understands it, is possible only in an environment undisturbed by war or even by the threat of war. The physicist has become a military asset of such value that only with the assurance of peace will society permit him to pursue in his own quiet way the scientific knowledge which inspires, elevates, and entertains his fellow men.

Thus by the very success of his efforts in this war, the physicist has been placed in an embarrassing position. The inheritor of the tradition of Galileo, Newton, Faraday, Maxwell, Gibbs, Rutherford, Michelson, and Einstein now is hailed as the messiah who will bring us a new world with push-button facilities, new industries, an expanding economy, and jobs for all. He is assailed with equal fervor by a thoughtful group of citizens who condemn him as the Frankenstein of our time and who hope that he will be placed in protective custody until we have solemnly taken thought of how one should live in an atomic age.

Industry, with considerable success, is trying to lure the physicist from his academic hide-out with glittering pieces of silver and with the promise of un-

A physicist born in Austria in 1898, I. I. RABI was brought to this country in his infancy, graduated from Cornell in 1919, and took his Ph.D. at Columbia University, where he serves today as Professor of Physics and Chairman of the Department of Physics. In 1939 the American Association for the Advancement of Science voted him a thousand-dollar award "for study of radio frequency spectra of atoms and molecules," and in 1944 he was the recipient of the Nobel Prize in Physics "for his resonance method of recording the magnetic properties of the atomic nuclei." During the war he acted as Associate Director of the Radiation Laboratory at M.I.T. and was closely identified with the development of radar.

limited scientific equipment and corps of assistants. Meanwhile our rejuvenated military forces are building giant laboratories (any one of which can use up all of our currently available and really well-trained physicists), and hope to stock them with men who can continue their scientific research and still adhere to the well-meaning but completely impossible regulations of the Civil Service Commission.

The *New York Times* proposes to alleviate man's lot by corralling the scientist in large research institutions, which it fondly imagines are of an industrial nature, where he would have as overseers and public guardians a group of wise men who know the important problems better than the scientist himself. Out of this pleasant hell there presumably would emerge cures for cancer and the common cold, rocket devices which would make a trip to the moon a week-end possibility for desk-weary stenographers, and so on. With childish faith in the capabilities of science and a complete lack of any understanding of the nature of scientific creation, the erudite news writer apparently believes that the theory of relativity or quantum mechanics could have been produced on order from wise men in Washington who by some sublime divination realized the necessity for these theories and were able to convince the Director of the Bureau of the Budget that the results would justify the expenditure of the taxpayers' money.

The universities hope the physicist will return to satisfy the needs of students. It has become obvious to the heads of institutes of learning that the future generation of scientists will be a sorry lot if the best teachers leave the academic circles for more lucrative positions in military or industrial laboratories.

The embarrassment of the physicists stems not only from the fact that they are unaccustomed to being courted with such ardor, but also from their realization, admitted readily by four out of every five, that in the past five years, apart from the development of certain techniques which may be useful in later research, the progress of the science of physics has been less than moderate. The same profound questions which furrowed the brows of physicists before the war and forced them to spend long days and nights in their laboratories are still with us. The physicist returning from the war has no vast amount of literature to digest before he can bring himself up to date in his field, because his own dusty files contain virtually the last words written upon the subject.

With atomic bombs and radar in mind, the skeptic may well ask what the physicist thinks he has been doing these past five years, if not physics. In a more heated vein, he may inquire just what are these problems which the physicist considers to be so important and yet which are so remote from practical possibilities that the intense research work of the war years has not touched upon them perceptibly.

These are probing questions. To answer them the physicist must attempt to explain the two aspects of his science. There is, first, the creative intellectual activity which constantly pushes back the boundaries

of our understanding of natural phenomena; second, the industrial activity which applies the results of scientific knowledge and understanding to satisfy material human needs and whimsies. The first is the science of physics proper, and the second is the side of physics which has been called the inheritance of technology. If the science of physics lags, the inheritance of technology is soon spent. In these war years, the inheritance of technology has been exploited to the point where further substantial progress can come only from an advance in the science of physics.

In the past, the science of physics was fifty years ahead of important technological application. For example, Faraday's experiments on the fundamentals of electromagnetic induction preceded the rise of the electrical industry by half a century. The growth in numbers, size, and quality of our modern industrial research laboratories and the great improvement of our schools of technology are bringing technological application very close to scientific discovery, as we can see from the fact that the infant science of nuclear physics has already resulted in the atomic bomb.

The essential unpredictability of the laws of nature beyond our experience, as exemplified in the great discoveries of the past, makes scientific research a venture, literally, into the unknown. To set out a detailed program with practical goals for truly scientific research is like trying to make a map of a country no one has ever seen and the very existence of which is in grave doubt. Pure science cannot have any goal other than the appeasement of the human spirit of intellectual adventure.

2

RADAR and the atomic bomb are two results of a planned program of research which made use of known facts and principles. The atomic bomb is an offspring of twentieth-century physics, while radar in principle is the child of nineteenth-century physics wedded to twentieth-century technology. Radar is the easier of the two devices to understand, since everyone is familiar with its stepfather, the radio.

In the latter part of the last century Heinrich Hertz, in Germany, succeeded in demonstrating experimentally the existence of what now are popularly known as radio waves. The existence of such radio waves had been predicted by Maxwell, who, on the basis of Faraday's electrical experiments, had written a set of mathematical relations defining their properties, which actually were the same as those of visible light, except for differences in wave length. Maxwell had predicted the existence of these waves, but had given no clue as to how to generate them. Hertz's tremendous discovery, however, showed that visible light was just a special wave-length region of an infinite spectrum of radio waves and that these waves all originated from the motions of electrical charges.

Hertz's contributions to scientific knowledge re-

sulted in a spectacular unification of a very large variety of isolated phenomena, including light, radio waves, and the motion of electricity — the intellectual tool which has made the whole art of radio possible. The further development of the art and science of radio was concerned with the generation, control, and detection of radio waves. A series of successively brilliant inventions gave us wireless telegraphy, then the radio telephone and radio broadcasting, and finally the "soap opera." One invention, the three-element vacuum tube of De Forest, was so outstanding in its consequences that it almost ranks with the greatest inventions of all time. Very few of our modern developments would have been possible without it.

Radar was implicit in Hertz's original experiments, but it had no practical development until the need arose for a new warning device to forestall surprise attacks by aircraft. Assuming that it took approximately fifteen minutes for a defending force to get its fighter planes off the ground and organized in a position where they could intercept attacking enemy bombers, it was obvious at the outbreak of the war that a warring nation must be warned of the approach of enemy planes within a minimum safety zone of seventy-five miles (at this distance a plane traveling three hundred miles an hour would be only fifteen minutes away). Such an aircraft-detection device obviously would have to work day or night, and in all types of weather. Many persons working in different countries, isolated from one another by walls of secrecy, arrived at practically the same solution at almost the same time. From this, one may be inclined to believe that the problem was not exceptionally profound.

The principle of radar was known throughout the scientific world before the war. The concentration of scientific talent on the development of the technological tools of radar resulted in a tremendous amount of progress in a very few years.

This development was concerned chiefly with the production and utilization of shorter and shorter radio waves, which could be directed as more concentrated beams, in order to obtain increasingly fine details of the objects under radar observation. In other words, the Army wanted to know not only that aircraft were approaching, but the number, type, and disposition of the planes, while the Navy wanted to know whether the invisible and unidentified object caught in the radar beam was a sampan, a battle-wagon, or just a rock jutting out of the water. The aiming of anti-aircraft guns by radar was the next (and still secret) step.

It is a fundamental law of physics that in order to produce narrow beams of radio waves the antenna on the transmitter must be many times larger than the wave length of the radio beam. Therefore, to avoid immense antenna structures, such as those which can be seen around any commercial radio station here in the United States, it was necessary to utilize shorter and still shorter wave lengths. The need for less

antenna was urgent, because radar sets were installed aboard ships as small as destroyers and in the limited interiors of fighter planes. From the conventional idea of antenna strung between two poles there eventually evolved antennas which were more like search-light mirrors and were no larger than an oversized salad bowl.

3

BORROWED from television and adapted to radar was the cathode-ray tube in which the echoes were displayed on the screen of the tube in a form instantly recognizable by the operator. In its final wartime form, radar could take a picture of groups of planes seventy-five miles away or draw a map of a city through thirty thousand feet of cloud layers.

All in all, we now have in radar something which resembles television, except that the picture on the screen is an object as seen through the medium of radio waves, rather than through light waves. Unlike a beam of light, the radio waves are invisible and can penetrate great layers of clouds, smoke, and haze. The future uses of the art of radar lie in two directions: from the ground, and from the air. In the first instance, radar enables us to see aircraft in the sky, regardless of darkness, fog, or the fact that the plane may be many miles away. We can look forward with confidence to the day when there will be no more "lost" planes circling in vain for a place to land.

The control towers on commercial airfields of the future will be able to tell a fog-enshrouded pilot where he is and guide him to a safe landing place. More than that, the radar-equipped man on the ground will be able to direct the course of the plane without the assistance of the pilot. It is a short step from having a man on the ground tell an invisible pilot what to do to having apparatus which controls the movements of the plane without human intervention. From the standpoint of commercial aviation, radar will be a lifesaving device, but the reader also can imagine the deadly possibilities latent in man's ability to build pilotless aircraft, buzz bombs, rockets, and jet-propelled missiles, each loaded with atomic bombs and able to follow an invisible beam to a predetermined target. He has only to envisage himself on the receiving end of this delivery line to get the feeling that this is a small world and the hiding places are very few.

Even more eerie than the possibility that invisible-eyed groundlings will be kings of all they survey in the air is the second prospect of future radar, that men in the sky will spy upon us from afar and know our every movement. Few objects of any size can escape the radar eye. Ships in even the loneliest waters cannot escape detection by high-flying observation planes, nor can trucks move at night without registering a change on a distant radar screen. Nations in a radar world will have little privacy, and the gap between the very advanced nations, technologically speaking, and the more backward ones is

becoming so great that the former, with very slight inconvenience, can wipe out the latter.

As a peacetime instrument, however, flying radar will have multiple uses. Airmen rapidly and accurately can map vast uncharted regions of the world. Clouds will not deter the bird's-eye view which man will have of waterways, mountains, and impassable jungles. Wherever pilots fly, they will have before them a visual image of the terrain that lies unseen below them. There will be no such thing as "visibility zero"; the radar screen will become an exact aerial road map.

It has been said that every weapon of war brings its own countermeasures, and this is true of radar. However, one should not permit himself to be lulled into a sense of security because of this fact. Only after the impact of a new weapon has been felt can work on the development of countermeasures begin. The rapid rate in which weapons recently have been developed has left the invention of effective defensive devices far behind. It is safer to be on the offensive than on the defensive, and the past few years have proved that a small margin of technical superiority often wins the battle.

4

THE story of the atomic bomb must be told in a very different manner from that of radar. In the first place, the principles involved are still new to even the most technically-minded persons; and secondly, they are intimately associated with the very structure of matter itself. One must start with the physicists' picture of the structure of matter as it was in 1919, the year that Rutherford in England effected the first artificial transmutation of nitrogen into oxygen.

On the basis of numerous experiments and close mathematical reasoning, it was believed, and nothing discovered since has changed this view, that all matter is made of unit structures, or atoms. Each chemical element has its kind of atom. The atoms themselves have structures of increasing complexity as one goes up the scale of atomic weight from hydrogen to uranium, but the architectural scheme is similar for all elements. Each atom has a central massive core, or nucleus, which contains almost all of the mass (weight) of the atom. The nucleus carries a charge of positive electricity and is very small in size — nuclei come about a million million to the inch. Surrounding the nucleus and moving under the intense electrical attraction of its positive charge are the electrons, which are very light, all identical in charge and mass, and negatively charged. Viewed as a whole, the atom is regarded as remotely similar to our planetary system with a massive central sun, the nucleus, surrounded by its electrons, like planets. Here the similarity ends, because the "planets" are not at all identical, and gravitational attraction plays little or no part in atomic structure. The electrical forces in the atom are vastly greater.

The number of electrons which surround the nucleus depends only on the amount of electrical charge on the nucleus. This charge is a definite number of times greater than the charge on the electron, and it is positive instead of negative. The number of electrons is equal to the number of units of positive charge which the nucleus carries. The structure as a whole is therefore electrically neutral, or uncharged, because the positive charges on the nucleus and the negative charges on the electrons balance out. It was hard then, and is now, to define the size of the atom exactly, but in general there are approximately one hundred million atoms to the inch, so that each is ten thousand times larger than the nucleus alone.

The difference between chemical elements is only in the amount of electrical charge which they carry on the nucleus, and consequently in the number of electrons which surround it. Most chemical elements have more than one variety of nucleus. These varieties of the same chemical element have different nuclear masses (atomic weight), but they all have the same positive charge. These varieties were given the name of isotopes.

The various elements and their isotopes have masses which are approximately an integral number of times the mass of the hydrogen nucleus. Hydrogen was discovered to be the simplest element of all, with a nucleus carrying only one unit of positive charge and consequently surrounded by only one electron. This nucleus was found to be of such importance that it was given a special name — proton. The ratio between the proton and electron mass was 1840 to 1. The electrical charges were equal in amount, but the proton was positive and the electron was negative.

As far as can be observed, chemical elements are usually stable over periods of billions of years in the sense that iron remains iron, and oxygen remains oxygen, without changing to something else. A few exceptions were noted, however, of which radium is still the most famous. Without any external intervention, radium, a metal, spontaneously transmutes itself into another element known as radium emanation, a gas. In the process of transmutation, the radium emits a helium nucleus known as an alpha particle. This splitting of radium into radium emanation and helium (alpha particles) occurs *within the nucleus itself*.

The alpha particle given off during the self-transmutation of radium was identified as the nucleus of helium, the second element in the table of elements, and was found to have two positive charges but a mass of approximately four in proton units. Since it comes out of the radium nucleus and is positively charged, the alpha particle gathers high speed from the intense electrical repulsion of the highly charged nucleus of radium emanation and therefore comes out with a great deal of kinetic energy — the energy of motion.

Since radium and some other elements were known to disintegrate naturally, it was concluded that the nuclei were complicated structures of unknown units, and there were great hopes of inducing transmu-

tations artificially. When physicists tried to induce artificial transmutations, however, even the intense heat of the electric spark produced no change in any of the nuclei. But in 1919, using alpha particles as fast bullets which could overcome the repulsion of the positive charge on the nucleus, Rutherford fired alpha particles directly into nitrogen nuclei and caused them to change into oxygen nuclei.

The reaction which Rutherford brought about artificially is worth studying very carefully, because a more complicated element, oxygen, was built up from two simpler elements, helium (alpha particles) and nitrogen. From this experiment, physicists learned that not only alpha particles but also protons could emerge from a nucleus.

5

ATOMIC nuclei are most extraordinary and fascinating objects. Contained in a very small space are a number of unit positive charges which exert great forces of intense mutual repulsion. Yet nuclei are found in general to be extremely stable structures. Under the intense mutual repulsion of the positive charges alone they would blow up instantaneously. It was therefore concluded that there must be some unknown intense forces of attraction which hold these antipathetic components together. What these forces are and how they arise was, and *still is*, one of the great mysteries of the science of physics. Since scientists could not understand the forces which held nuclei together, they could not understand how much energy was released in a nuclear reaction.

The way to calculate the amount of energy released in a nuclear reaction was discovered not through nuclear experiments but in a manner which is an interesting illustration of how different developments within a science dovetail to form the whole structure. In 1905, Einstein enunciated the theory of Special Relativity from a general consideration of the nature of clocks, the measurement of time, and the remarkable consistency of the velocity of light as measured on different systems moving relatively to one another. As a straightforward deduction from this theory, he enunciated the equivalence of mass and energy.

For our purposes, it can be stated from Einstein's theory that if there is a change in the energy of some system, such as a nucleus or a collection of nuclei, there will be a perfectly definite equivalent change in mass. This statement gives us one of the most powerful tools in nuclear physics, because it enables us to find the energy released during a nuclear reaction by measuring the change in mass after the reaction. If one can measure accurately the original mass of a nucleus and the masses of the products of a reaction, the difference in the mass will immediately give the amount of energy which has been released for use.

From 1919, the year of the Versailles Treaty and Rutherford's experiments with artificial transmuta-

tion, our story of the development of nuclear physics jumps to 1939, the year of the outbreak of World War II and of the discovery of the nuclear fission of uranium. Those twenty years between two wars were among the most revolutionary in the history of physics. They marked the experimental verification of Einstein's Theory of General Relativity and the complete revision of our concepts of space, time, and gravitation.

During this period there arose the wondrous intellectual structure which is known as quantum mechanics, which gave us complete and quantitative insight into atoms and molecules and finally wedded physics and chemistry into one science. The scientific, philosophical, and moral implications of quantum mechanics, with its rejection of the classical doctrine of causality, have not yet been exhausted by our generation and are hardly known to the educated public.

The greatest experimental development during the brief period of peaceful scientific progress was in the field of nuclear studies. The outstanding event was the discovery of the neutron by the English physicist, Chadwick, in 1932. The neutron is what really makes the atomic bomb tick. It was a brand-new particle previously unknown to physics. The neutron is just perceptibly greater than the proton mass. It is just a bare nucleus without a positive charge, and consequently has no negatively charged electron surrounding it. Since it is neutral, the neutron is not affected by the electrons which surround the nucleus of an atom, and when it is employed as an atom-splitting bullet it can only be stopped or deflected by the nucleus itself. Hence the neutron can readily penetrate inches of lead or other dense material.

This great discovery made it possible to begin to understand the structure of atomic nuclei. They are now assumed to be composed of neutrons and protons, usually of more neutrons than protons. Two chemical elements, such as oxygen and nitrogen, differ from one another by the number of protons in the nucleus, which determines the total nuclear charge. Atoms with the same number of protons in their nuclei, but with different numbers of neutrons, have the same chemical properties and, as explained earlier, are known as isotopes. Some elements have as many as twelve different isotopes. Uranium, which until recently was considered the heaviest of all elements and the last in the periodic table of elements, has been found to have three important isotopes, which have mass numbers 238, 235, and 234. The charge on each isotope corresponds to 92 protons, and the rest of the mass is furnished by neutrons.

Fermi and his school of physicists in Italy were among the first to realize the power of the neutron as an experimental tool for the study of nuclei. Since the neutron carries no charge, there is no strong electrical repulsion to prevent its entry into nuclei. In fact, the forces of attraction which hold nuclei together may pull the neutron into a nucleus. When a neutron enters a nucleus, the effects are about as

catastrophic as if the moon struck the earth. The nucleus is violently shaken up by the blow, especially if the collision results in the capture of the neutron. A large increase in energy occurs and must be dissipated, and this may happen in a variety of ways, all of them interesting.

Following Fermi's lead, physicists all over the world took up with vigor the sport of bombarding nuclei with neutrons. Neutrons were easily obtained. For a few thousand dollars, furnished by a benevolent foundation, one could buy or rent a quantity of radium salt, which gave a very handy neutron source in compact and portable form when it was mixed with powdered beryllium. The neutrons came from the disintegration of beryllium by the fast radium alpha particles. Later on, the cyclotron became a more powerful and more controllable source of neutrons.

The discovery of neutrons began a dramatic sequence of events which led to the atomic bomb. Fermi and his associates commenced around 1934 to study the effects on uranium of neutron bombardment and capture. The results of their experiments were most puzzling. It was assumed that the elements which were produced by the nuclear reaction were in general of greater atomic weight and charge than uranium, but no logically consistent and clear account of the phenomena could be made. The problem continued to baffle scientists until 1939, when Hahn and Strassmann in Germany announced early in that year that *barium* was one of the products of the bombardment of uranium with neutrons.

The gold strike on the Klondike was as nothing compared with the effect of the Hahn-Strassmann announcement on the tight little world of physicists. All over the globe, physicists unleashed their cyclotrons, their Geiger counters, and their ionization chambers, and by the end of the year nearly one hundred articles had appeared on the consequences of this discovery by Hahn and Strassmann. One hundred articles is a large number when one considers that usually some sort of experimentation has to be done or some calculations made before a scientific article can be written.

Why all this pother? The answer is simply this: while all other nuclear disintegration previously observed had resulted in the release of an alpha particle, a proton, or a neutron, the emergence of barium from a nuclear reaction was a vastly different matter. Barium has only a little more than half the mass of uranium. The immediate conclusion, soon justified by experimentation, was that the uranium had split into two nuclei of almost equal mass as a result of the neutron capture. Each nucleus had a large positive charge of approximately 40. The two halves therefore flew apart with an enormous release of kinetic energy, and the process was aptly named fission in analogy to the biological splitting of cells. The amount of energy released during the fission process was easily determined by Einstein's statement of the relation between changes of mass and energy. The sum of the masses of the two fragments was less than

the original mass of uranium, which means energy release.

The amount of energy released by the nuclear reaction was found to be two hundred million electron volts, as compared with that released by chemical reactions, which ordinarily is less than five electron volts. The nuclear reaction therefore released more than forty million times as much energy as a chemical reaction between atoms. It did not take the physicists more than a few minutes to realize the implications of these experiments. As an instance, I was residing in Princeton, on sabbatical leave from Columbia, when Professor Bohr, the great Danish theoretical physicist, arrived with advance news of the Hahn-Strassmann experiments. The next morning I visited Columbia and told the news to my colleague, Fermi, who had by that time left Italy to join our faculty. By nightfall he was already speculating on the size of the crater which would be produced if one kilogram of uranium were to disintegrate by fission. Similar scenes were occurring all over the world. The race for the atomic bomb was on.

6

THE two-billion-dollar questions which had to be answered before the atomic bomb could be realized were: (1) Did all three uranium isotopes undergo fission, and if not, which of the three was the important one? (2) Were any neutrons released during the violent fission process, and if so, how many on the average? (3) Did the remaining non-fissionable isotopes absorb neutrons to any great degree?

As was stated in the official report on the development of the atomic bomb, it was known by 1940 that only U235 (Uranium 235) was important for fission by neutrons of all speeds and that neutrons of certain speeds were captured by U238 to produce U239. It also was known by this time that the average number of neutrons emitted per fission was somewhere between one and three, and that these neutrons were mostly of high speed. These facts were very encouraging and fortunate for our side in this war, because they showed that an atomic bomb was possible and also so expensive that the enemy could not produce it. The reasoning runs like this:—

If more than one neutron is released during the fission process, the fission of one uranium nucleus will produce enough neutrons to set off more than one other uranium nucleus, and the whole process will multiply rapidly with explosive effect, producing what is called a chain reaction. The chain reaction will die out, however, like a fire in wet wood, if less than one neutron is produced per fission or if the neutrons, while passing through the uranium, are absorbed to a sufficient degree by some process which does not produce fission. It is clear that the chunk of uranium has to be large enough for the neutron to do its work by colliding with a fissionable nucleus before it can escape through the surface of the uranium.

Also, another important point, the neutrons must be fast to give the chain reaction time enough to consume an appreciable portion of the uranium by disintegration before the gigantic energy release blows the entire bomb apart.

Fortunately for our side, the atomic bomb was bound to be extremely expensive to produce. U235 is only one part in 140 of the mixture of isotopes which ordinarily is bulk uranium. U238, which is 99.3 per cent of bulk uranium, absorbs neutrons and thus would stop the reaction. To make a bomb, pure U235 was needed, and relatively lots of it. The separation of U235 from U238 in bulk was never attempted before and turned out to be a peculiarly difficult and costly process. To ordinary peacetime thinking, it would have been termed impossible because of the expense. Here lay our good fortune, because, unlike any other nation, we had the manpower, the money, and the time to do the task. If the abundant U238 had been the important agent in atomic bombs, our cities would have been obliterated before we entered the war, because our enemies, although short on resources, were fully aware of all the possibilities.

Another side to the development of the atomic bomb is still more eerie. The capture of a neutron by U238 yields U239, which has a property, in common with some other nuclei, of spontaneously increasing its positive charge. The increase occurs in two successive steps by a process which essentially entails the creation of electrons. The electrons are ejected from the nucleus, which becomes an entirely new element, plutonium, of mass 239 and charge 94, instead of the 92 charge of uranium. This element is found nowhere on the face of the earth and represents an entirely new creation. It was suspected and later proved that plutonium also possesses the requisite fission properties to be the new material for a bomb. Plutonium had the advantage over U235, because it was an entirely different element from U238 and consequently, once made, could be separated from U238 by cheap chemical methods.

As a nation we can congratulate ourselves on having leaders in this country who were bold enough to appropriate the vast sums necessary to make this new element, atom by atom, through the bombardment of U238 with neutrons, when no certainty existed that the process would prove successful or that plutonium would be useful in an atomic bomb. Although most people feel, now that success has been achieved, that the effort was justified, one can imagine the fury of the defenders of the treasury if the gamble had turned out otherwise.

7

I HAVE said that, as a result of the war, science has advanced only moderately, despite these great technical developments. It is not my purpose, nor would it be right, to minimize the vast industry, the keen insight, the resourcefulness, and the imagination of

the scientists and engineers who performed these gigantic deeds of scientific valor. Extensive areas of scientific knowledge were consolidated by their efforts, and new scientific tools of a power previously unknown were forged in their laboratories. Our advance in pure science, when we get back to it, may be greatly accelerated by the use of the new techniques developed during the war, if those whose business it is to supply the funds will stand the expense and not insist upon calling the tune.

It might be well at this point to recall some of the still unanswered fundamental scientific questions which physicists were asking themselves in 1940. More than a quarter of a century has passed, for example, since Onnes in Holland discovered the phenomenon of superconductivity. Briefly stated, he found that some metals, such as lead, when cooled to temperatures of a few degrees above absolute zero, suddenly lost all trace of electrical resistance. Once a current was started on a loop of wire at this temperature, the current continued indefinitely. Why? The question is all the more tantalizing since we understand quite well the factors which cause ordinary electrical resistance. One wonders whether the Onnes discovery is an accidental phenomenon or a profound one. All our ideas concerning the conductivity of electricity in metals remain in doubt until this problem is solved. If one were able to produce a resistanceless wire, its effect on the electrical industry would be revolutionary.

The great scientific objective of nuclear physics has been the elucidation of the forces which hold the aggregate of neutrons and protons together within their nucleus despite the strong electrical repulsions of the constituent protons. This primordial force which makes matter as we know it exist at all is unlike gravity or electrical forces, which fall off inversely as the square of the distance between force centers. It is a very short-range force which acts only over distances of about the size of the nucleus and then decreases very abruptly. Yukawa, a Japanese scientist, has suggested that the unknown force may have a connection with a new particle of mass intermediate between the electron and proton. Such a particle, the mesotron, has indeed been found since in cosmic rays and has become a fascinating field of study in itself.

Mesotrons seem to appear in a manner which would delight the professional magician. Apparently very rapidly moving protons such as are to be found in cosmic rays produce mesotrons when they collide with the nuclei of oxygen and nitrogen, the chief components of the earth's atmosphere. It cannot be said that the mesotrons are ejected from these nuclei, or from the cosmic-ray protons; they simply appear as if by an act of creation during the violent collision. The phenomenon is very new; and for all we know, there may even be a wide variety of mesotrons. The energy which is represented by the mass of the newly created mesotron comes at the expense of the kinetic energy of the fast proton.

The mesotrons themselves seem to be real enough. They have an electrical charge of the same amount as the electron and a mass about two hundred times as great. They produce good, healthy, visible tracks in a Wilson cloud chamber and give every evidence of definite, real, concrete existence. Yet after a brief period of about one millionth of a second, they disappear into limbo, and all that is left is a very ordinary electron and some short-wave light energy of the X-ray variety.

These discoveries and unanswered questions pertaining to the nature of mesotrons and nuclear forces represent the first isolated tentacles which will encompass an interesting field of the physics of the future. Very few advances along these lines of research were recorded during the war years.

To probe still deeper, it is an experimental fact that matter is made up of small units like electrons, neutrons, and perhaps other particles still unknown. One asks oneself why electrons should be all alike. Why should electricity come out in certain definite units like the electron, no more, no less? There exists a positive electron, called the positron, which was discovered by Anderson in California about the same time that the neutron was discovered. The particle is in all respects just like the electron, except that its charge is positive. A positron and an electron can unite in mutual annihilation. All that comes off is some short-wave radiation like X-rays of energy corresponding to the Einstein relation between mass and energy. Conversely, radiation can be destroyed to produce a positron-electron pair. Why does it turn out that these two have exactly the same charge and mass, no matter where or how produced? This is a property of light or electronic radiation which radar research does not touch.

Looking back now to the period before 1932, we seem to have been living in a simple, innocent world. We had the electron, the proton, and light, and all the observable properties of matter were to be worked out in terms of the interplay of these factors. Then in rapid succession there were discovered the positron, the neutron, and the possible varieties of mesotrons, which had hardly entered anyone's thought before. These particles are all real in the sense that we can obtain direct experimental effects from any of these single isolated particles. But there is another particle, which, if it did not exist, would have to be invented. This one is called the neutrino and, because of its postulated nature, no one has yet devised an experiment by means of which it might be observed.

The need for the neutrino arises from the method which physicists employ to balance their books. In the physicist's notebooks there are at least four entries in which the credit and debit sides of the ledger must balance; otherwise the life of the physicist would hardly be worth living, so lawless would natural phenomena appear. The entries come from the so-called conservation theorems. The first of these is the conservation of charge, which states that the total

net amount of charge remains constant. If a new positive charge appears somewhere, an equal amount of negative charge will also appear to balance it. The mutual annihilation of an electron-positron pair does not change the total charge.

The second conservation theorem is the law of the conservation of energy, now well known to all. This law states that if energy or mass disappears in one way it must reappear in an equal amount in another. The two other conservation laws — the conservation of momentum and the conservation of spin — are not so familiar but are just as important.

It has been known for a long time that in certain radioactive processes, such as the one in which U239 changes into plutonium by emitting two electrons in successive steps, the last three conservation laws are not fulfilled. The sums of the energy, momentum, and spins of the end products (that is, of the transformed nucleus, the ejected electron, and the radiation) do not balance with what was on the nucleus in the first place. Rather than give up these cherished conservation theorems, we assume that another particle, happily named the neutrino, emerges at the same time as the electron and shares the energy, momentum, and spin with it in such a way as to balance the books. The mass which the neutrino has to have in order to do the job for which it was designed is practically zero.

Admittedly all this may be rather fancy scientific figure-skating, but such speculations have the habit of turning out to be right. Only further research will reveal whether the neutrino must remain a ghost or whether it will take on the flesh and blood of direct experimental confirmation.

We do not know the answers to these questions or to other questions equally searching and fundamental. The development of radar or the atomic bomb was almost irrelevant to them. The answers will surely come if the science of physics continues, and probably from the most unexpected sources. The process of fission was found through chemical analysis; the positron was discovered, of all places, in the study of cosmic rays. After the discoveries are made, it is hard to see how they could have been missed. In the study of natural phenomena, man is a very nearsighted creature, and even the most profound and original man can see but a very short distance. It is a great adventure where close study, patience, intuition, and luck each play a part. It is the last frontier left to the free spirit of man in a crowded world.

The physicist returns from the war to cultivate his science. The answers to his questions will not be the end of all wisdom and knowledge. When scientific enigmas die, they give birth to twins. We are the inheritors of a great scientific tradition and of a beautiful structure of knowledge. It is the duty of our generation to add to the perfection of this structure and to pass on to the next generation the best traditions of our science for the edification and entertainment of all mankind.

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