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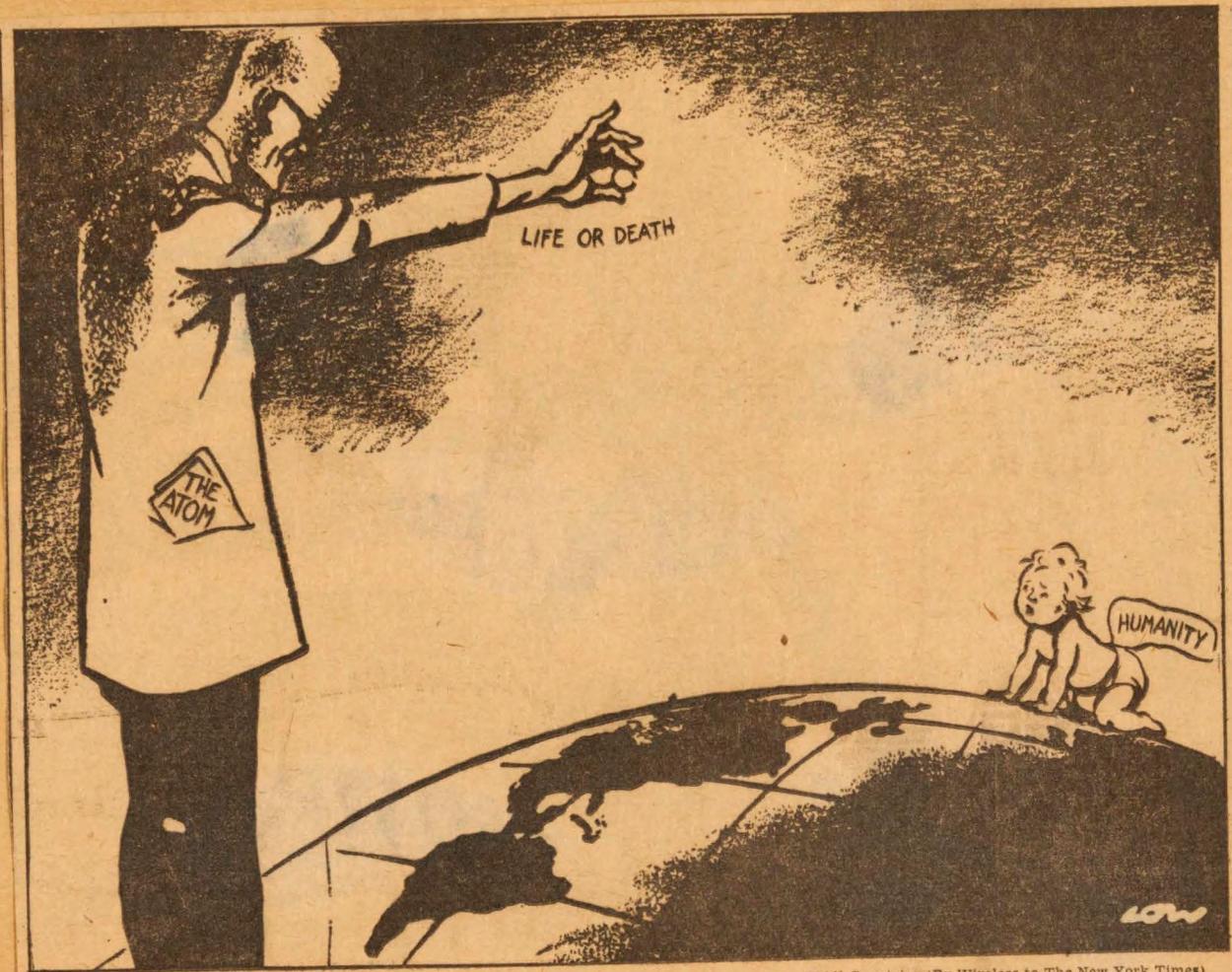
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"Baby play with nice ball?"

8-12-45

Science Sees Bomb Ending War

Physicists Also Expect It to Have Profound Influence on Peacetime Pursuits.

Atomic power promises to end the Pacific war quickly and to exert tremendous influence in peaceful pursuits in the post-war era, New York scientists agreed today after President Truman's revelation of the new atomic bombs just loosed on Japan.

Dr. George B. Pegram, dean of the Graduate Faculties of Columbia University and professor of physics, was in a day-long conference and declined to talk with newspaper men. Through his secretary he informed the press that he was not allowed to discuss the development, which has been carried on with greatest secrecy. He stated that the Government's announcement from Washington would have to stand without embellishment from him at this time.

Dr. Pegram announced on January 31, 1939, that Columbia University's new atom-smashing machine, or cyclotron, had accomplished the largest conversion of mass into energy ever obtained by man by the creation of 100,000,000 electron volts from a shattered atom.

Dean Pegram conducted the experiment with Prof. John Dunning and several laboratory assistants. The experiments were proposed by Prof. Enrico Fermi, Nobel prize winner in physics in 1938, who was at Columbia. They were suggested by theories advanced by two German scientists.

Experimentation Deeply Secret.

The experiment at Columbia, in which the heavy element of uranium was used, was held at the time to be comparable in significance to the original discovery of radio activity thirty-five years ago because the power created was at least ten times greater than the natural amount of energy released by radium.

Since the war the experimental work necessarily has been carried on in great secrecy and little was known of recent developments.

"The announcement today may prove to be one of the most important chapters in the history of science," commented Dr. Harvey N. Davis, president of the Stevens Institute of Technology, Hoboken. "I could not be quoted about the development or the use of atomic energy because we have not conducted studies or research along those lines. But they have done a great deal of work on it at Columbia University. I think it is entirely possible that a great new force will be found and used here."

Scientists of the Western Electric Company, Inc., said they had not worked on the specific problem of the atom. However, they

were highly interested in the development and predicted a staggering new force from this source. Princeton University officials said the great physicist, Dr. Albert Einstein, was away on vacation and could not be reached by telephone.

Jewish Woman Started Hunt.

The atomic bomb hunt started right after the war got under way when a German mathematician, a Jewish woman, Lize Meitner, calculated that something which had puzzled scientists for ten years was really an explosion of atoms of one form of the metal uranium.

Lise Meitner, according to the Yiddish Scientific Institute, 535 West 123d street, is a physicist who was born in Vienna in 1878. She was associated with the University of Berlin, first as a lecturer and then as an assistant professor, until 1933, when she was dismissed because she was

not an Aryan. She continued to work in Berlin for a time, however, as a member of the Kaiser Wilhelm Institute for Chemistry, at Berlin-Dahlem. From there she went to Stockholm.

She is the author of at least two books on the atomic theory: "Beitraege Zur Physik Der Atomkerne," published in Germany in 1926, and "Der Aufbau der Atomkerne," published in Germany in 1935. Max Delbruck collaborated with her on the latter work.

Scientists Verify Her Prediction.

Within two weeks after the publication of this calculation the great physics laboratories in the United States, England and Germany had verified her prediction. She was banished from Germany shortly afterward, but Hitler put all available physicists at work on atomic bombs and atomic power at the Kaiser Wilhelm Institute, Berlin.

What the scientists found was that a rare form of uranium, known as 235, when bombarded with low electrical energy (in the form of neutron rays) would react by splitting some of its atoms almost squarely in two.

Two Choices

By Eleanor Roosevelt

The news which came to us yesterday afternoon of the first use of the atomic bomb in the war with Japan may have surprised a good many people,



but scientists—both British and American—have been working feverishly to make this discovery before our enemies, the Germans, could make it and thereby possibly win the war.

This discovery may be of great commercial value some day. If wisely used, it may serve the purposes of peace. But for the moment we are chiefly concerned with its destructive power. That power can be multiplied indefinitely, so that not only whole cities but large areas may be destroyed at one fell swoop. If you face this possibility and realize that, having once discovered a principal, it is very easy to take further steps to magnify its power, you soon face the unpleasant fact that in the next war whole peoples may be destroyed.

The only safe counter weapon to this new power is the firm decision of mankind that it shall be used for constructive purposes only. This discovery must spell the end of war. We have been paying an ever increasing price for indulging ourselves in

this uncivilized way of settling our difficulties. We can no longer indulge in the slaughter of our young men. The price will be too high and will be paid not just by young men, but by whole populations.

In the past we have given lip service to the desire for peace. Now we meet the test of really working to achieve something basically new in the world. Religious groups have been telling us for a long time that peace could be achieved only by a basic change in the nature of man. I am inclined to think that this is true. But if we give human beings sufficient incentive, they may find good reasons for reshaping their characteristics.

Good will among men was preached by the angels as they announced to the world the birth of the child Jesus. He exemplified it in his life and preached it himself and sent forth his disciples, who have spread that gospel of love and human understanding throughout the world ever since. Yet the minds and hearts of men seem closed.

Now, however, an absolute need exists for facing a nonescapable situation. This new discovery cannot be ignored. We have only two alternative choices: Destruction and death—or construction and life! If we desire our civilization to survive, then we must accept the responsibility of constructive work and of the wise use of a knowledge greater than any ever achieved by man before.

NOVEL PREDICTED ATOMIC EXPLOSION

Harold Nicolson, British author, in a book of fiction, "Public Faces," published in 1933, spoke of the possibility of an atomic explosion "that would destroy all matter within a considerable range and send out waves that would exterminate all life over an indefinite area."

The writer becomes more specific. "Mr. Bullinger," he writes, "was not very clear in his own mind as to the nature or potentiality of this second line of research. He knew only that the experts had begun to whisper the words 'atomic bomb' and . . . had explained to the Cabinet . . . that a single . . . bomb, no longer than this inkstand . . . could by the discharge of its electrons destroy New York."

Nicolson was not the only British writer interested in atomic explosions. The Earl of Birkenhead, who "The World in 2030" was published in 1930, wrote: "A biological discovery may well plunge the world into such a catastrophe as would destroy civilization for a thousand years. As you are reading these words, some disinterested researcher may detonate an atomic explosion which will involve the world, and reduce it to a flaring vortex of incandescent gas."

URANIUM.

The sensational publicity given the atomic bomb and the element uranium, necessary in the production of the new earth-destroying force, turned the market's attention to certain mining stocks. The Vanadium Corporation received considerable space as a producer of uranium, and the stock, which had closed down a quarter yesterday at 24, opened on 1100 shares at 24 3/4 and ran up to 27 1/4 before meeting profit-taking, induced no doubt by the slide of prices all round on the rumors of another ultimatum to Japan and the guessing of an early peace.

N.Y. SUN, AUG 7

THE FUTURE OF OIL AND ATOMIC POWER

Chicago, Aug. 7 (A. P.).—About 50 per cent of the petroleum industry's annual output is "safe and secure" from competition from atomic power, Dr. Gustav Egloff, a leading authority on petroleum technology, said today.

Dr. Egloff, chief chemist at the Universal Oil Products Company and a pioneer in a process known as "oil cracking," said in an interview that nearly half the industry's production is utilized for purposes other than power.

"Atomic power—as an economically competitive substitute for gasoline for ships, planes, cars and other vehicles—still appears to be on a long road ahead," he said.

"However, assuming that time comes, the oil industry still will be needed to provide lubricating oils for the machines driven by atomic power. Wax and other by-products from petroleum still will be on the market and other uses may be expected to be developed by research."

He said the petroleum industry was "watching very carefully" every source of energy with the ability to provide power and that it "welcomes discoveries convertible into practical use which will shorten the war and develop new uses in the peace period."

He described development of the atomic bomb in three years as "literally a scientific and technical miracle."

Radium Rays Provide Atom Bomb's Trigger

Beryllium, Paraffin Wax and Uranium-235 Also Used in Firing Mechanism.

By HOWARD W. BLAKESLEE,
Associated Press Science Editor.

The trigger which was expected to set off the atomic bomb was a fairly simple mechanism, as planned just before the secrecy blackout.

Censorship permits now a description of the early trigger because its details were published before the blackout.

The mechanism was a bit of radium, a bit of the common metal beryllium, some paraffin wax and a little uranium 235. It was developed at Columbia University, and in modified form in other American laboratories as well as in England, France and Germany.

The rays of the radium struck the beryllium and caused that metal to emit rays of its own. These rays from the metal were different than those from radium. They were neutrons, which are non-charged particles and very penetrating.

As the neutron rays came off

the beryllium, they were traveling too fast to have any effect on the uranium. Here the job of the paraffin wax came in. It slowed down the neutron rays. When the neutrons reached the very slow speed which is designated by 25,000 volts, these particles easily split the uranium atoms in twain.

That split released enough explosive energy to make an atomic bomb possible. The problem was to get the uranium to continue exploding its atoms automatically after the trigger had started the fire. The pre-war uranium atoms supplied a key to this last problem.

When a uranium atom split it emitted not only the explosive energy, but also a few neutrons. These neutrons were traveling

too fast to break other uranium atoms. But if they could be slowed down they too would break atoms, and would presumably set off an atomic explosion by the large numbers of atoms cracking simultaneously.

Germans Tried Heavy Water.

It was calculated, and published, that this kind of slowdown could be accomplished readily. This would be done either by packing the uranium in paraffin, to slow the neutrons, or by using plain water as the slowing agent, for water works about as well as paraffin.

Whether this experiment was done or even tried never was published. When the blackout went on scientists had not had enough uranium 235 to make the test.

The unexplained use of heavy water by the Germans, from a plant in Norway, might be connected with attempts to slow down the speed of neutrons to produce atomic explosions in uranium. Heavy water contains hydrogen of twice normal weight. And in water of paraffin the hydrogen is the principal slowing barrier to neutrons.

The Hand of God *By Eleanor Roosevelt*

THURSDAY.—When William Cowper, in his "Light Shining Out of Darkness," wrote the lines:
God moves in a mysterious way

His wonders to perform;
He plants his footsteps in the sea,

And rides upon the storm.
He was hardly thinking about our new world—the atomic world in which we are living today! One must, however, feel the hand of God as one ponders the story of Dr. Leise Meitner working with her two German colleagues.

When Hitler came to power the first steps of our new discovery had been made. Hitler tried to force Dr. Meitner to divulge her knowledge; but being a Jewess and seeing the rising tide of hate, she left for Copenhagen. Her knowledge finally reached the famous scientist, Dr. Bohr, who was then working in the United States. Dr. Meitner, I understand, says that she does not know how much she contributed to the ultimate making of the atomic bomb. This much we know—that at the foot of the pyramid there was a woman who had the courage to face new knowledge. How ironic that it is the Germans' hate and persecution of a minority which may have prevented them from making this discovery first.

I wonder if we can learn from this story a lesson which I think God in His heaven must be trying

very hard to teach us. He does not discriminate on lines of race or religion in the tools which he uses. Clearly He is asking us whether we have learned the lesson that in His world there is no place for discrimination or for hate. He has given into our hands the knowledge of a force so great that men can bring about their own destruction. God must believe that man has reached the point where he can bring about his own salvation.

As I read that dramatic story of Dr. Meitner's, I could not help thinking that her courage was a challenge to every other woman in the world, and that perhaps we were meant to see that women have a grave responsibility which we cannot shirk. Many of us recognize and admire the greatness of Mme. Curie, who gave something beneficent to mankind. But Dr. Meitner contributed the first steps in an invention which gives mankind power over his own fate. It is a great step forward, but like all steps forward it is somewhat awe inspiring.

Not to be afraid of it, one must have great faith in human beings. Person after person has said to me in these last few days that this new world we face terrifies them. I can understand how that feeling would arise unless one believes that men are capable of greatness beyond their past achievements. The times have usually brought us a leader when we needed him. The times now call for mankind as a whole to rise to great heights. We must have faith or else we die.

Aug 10, 1945

Decisive Days *By Eleanor Roosevelt*

FRIDAY.—I could not help feeling a little sad yesterday when the news came that we had had to use our second atomic bomb. I had hoped that



after the first bomb, which was followed by Russia's declaration of war and their prompt entry into Manchuria, the Japanese would decide to accept unconditional surrender, and the loss of life could come to an end. I still hope that may happen; and it is also the hope of a great many other people, for all news agencies seem to be aware that a momentous decision must be made within the next few days.

In the rapid succession of world events, I am interested to see how short are people's memories! Once upon a time the Americans and the British were being urged at every turn to start a second front in Europe. At that time, the Soviet Union was carrying a very heavy burden in the war against Germany. She thought us over-cautious in our preparations and a long time coming to her aid. People in this country were quite indignant at this. They wondered if Russia did not under-

stand that an ocean lay between us and Europe, and that problems of supply and transportation were overwhelming.

Now the boot is on the other foot. If it had not been for the atomic bomb, we would have heard a continual wail because the Soviet Union was so slow in coming to our aid. She is reciprocating by wondering whether we have no understanding of the fact that an army had to be transported practically across a continent! I can hear some people say: "Oh, but the Russian army needs no supplies. They can live off the country." Perhaps—but guns and ammunition and all the other mechanized equipment must get from Germany to the borders of Manchuria, and it is probably a tremendous feat that the Soviet Union has been able to join us so soon.

Somehow we must try to get over some of the attitudes we have held, not only as regards the Soviet Union but as regards other people. For instance, I heard someone say the other day: "Well, perhaps we will be fighting the Soviet Union." In the light of the late developments, that now means annihilation. There is only one answer to these fears, and that is a belief that the Soviet Union and the United States, as well as the United Nations as a whole, can live peacefully together—and a determination on the part of their people to do so.

Abroad

The Promethean Role of the United States

By ANNE O'HARE McCORMICK

Thousands upon thousands of words have been and will be uttered about the atomic bomb. It has caused an explosion in men's minds as shattering as the obliteration of Hiroshima. Compared to the change in the very design and balance of force foreshadowed in this new release of energy, the revolution of Marx and Lenin, the speed-up of the Power Age, are like a mere shifting of the gears of progress. From the dawn of creation until the turn of this century the atom was the indivisible unit of matter. The inhabitants of this planet rested, so to speak, upon a floor of solid particles, unaware that these infinitesimal paving blocks were dynamite, waiting to be blown up.

This week has changed all that. The earth is no longer solid. Out of the forces that hold it together human genius has summoned forces that tear it apart. The bomb that burst over Japan contained destructive energy enough to destroy a great city. It was an ultimatum to end all ultimatums because it was only a small sample of what lies hidden in the laboratory where soldiers joined with scientists to produce in record time the deadliest weapon in the history of war.

But the ultimatum was not only to Japan. The first reaction of the Allied world to this literally earth-shaking event was relief that this engine of immeasurable destruction was not in the hands of the enemy, as it might have been if the Germans had been able to hold out another year. But in this relief was no elation; it was mixed with wonder, fear and deep misgiving, for every man knows in his heart that the bomb that harnesses the fire of the sun and the sleeping forces of the earth itself to the business of war is an ultimatum to the human race. Make peace, it says, or perish.

Not Launched Lightly

The words spoken by the detonator make everything said about it sound hollow. Yet the statements of the President, the Secretary of War, Mr. Churchill and the military officers who described the tests in New Mexico are solemn and weighty pronouncements. They are the utterances of men profoundly conscious of the gravity of the decision they took in approving the use of this last weapon to end the war. It is a weapon developed by the scientific brains of democratic nations, with the decisive help of great German pioneer research workers like Dr. Albert Einstein, Dr. Lise Meitner and others whom Hitler rejected because they were "non-Aryan." It was launched under the aegis of democratic powers, the United States, Great Britain and Canada. Not even Russia shares the knowledge of the formula and the process by which nature's most potent secret has been put at the service of man.

It was not launched lightly. The words of the democratic leaders express the solemn sense of responsibility. They fear for the use of the most thrilling and the most terrifying discovery of our time. They know that it depends on them whether it becomes a terrible boomerang or the ultimate force that will revolutionize international life. It depends on the democratic peoples. It is impossible to imagine any government spending \$2,000,000,000 on a laboratory or any other experiment that would bring peace to the world. If nations used their brains and their wealth prodigally to win peace as they do to win wars, the story of the twentieth century—the most scientifically advanced and the bloodiest in history—might be different.

Power to Shape the Future

But perhaps the money, the teamwork of scientists of many nations and the zeal that went into the almost god-like task of splitting the atom will turn out to be an investment in peace. It is recognized by everybody that the bomb must be one thing or another, an instrument of life or an instrument of death. It will not remain long the secret possession of the nations that invented it, but for the present, for the crucial interval when the world must be organized as an entity or divide into spheres of power, it is controlled by three democratic nations. Although many may deplore that it was used first by the United States, this fact underlines that in a special if not exclusive sense it is controlled by us. It is another sign and instrument of our power to shape the future of the world.

It is hard to foresee the consequences of the new force we have released. It changes the conception of armies, navies and air forces, changes the face of war itself. It is obvious that if it is to continue to be a weapon when this war is over, whoever uses it first will be the winner. But the winner will preside over a dustheap.

Developed to its capacity, the atomic bomb makes peace imperative by making war impossible. Even if it is never used again, it must shorten the fight with Japan. Even if it is never used again as a carrier of death, it is the most unanswerable argument yet advanced for a community of nations leagued together for self-protection in the pursuit and maintenance of peace. The atomic bomb can turn the world into a graveyard or a garden, and the United States, the Prometheus who has dared the heavens to invoke this power, has assumed the first responsibility for deciding which it shall be.

In the words of Mr. Churchill: "This revelation of the secrets of nature long mercifully 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."

On The Record

By Dorothy Thompson

Disintegration—or Integration?

By God's mercy British and American science outpaced all German efforts. Possession of these powers by the Germans . . . might have altered the results of the war . . . and profound anxiety was felt by the informed.—Winston Churchill.

The atomic bomb was not the product of British or American science, but the result of co-operative efforts of international scientists, the chiefs of whom by the grace of Adolph Hitler came into the world of the western democracies.

Dr. Lise Meitner was a German, associate of Prof. Otto Hahn, eminent German physicist. She had to leave Germany because she was of the Jewish race. She carried with her knowledge of the work in Prof. Hahn's laboratory, and received impetus to further research, which found a key to the mystery, through a report in a German scientific review.



Prof. Niels Bohr is a Dane. He also had personal reasons for wishing to use his brain in behalf of the democracies resisting the oppression of his countrymen. Prof. Enrico Fermi was an Italian, who used the presentation of the Nobel Prize to come from Stockholm to America, and escape the Fascist world.

So there is a poetic justice—perhaps the justice of God—in the fact that Hitler's aggression against the Jews and his neighbors helped deliver into the hands of the western democracies the most terrible weapon that ever existed.

Need We Have Used It? But whether God's mercy will be associated with its invention, the future will have to record. It is difficult to justify in the name of God the first use to which it was put. The atomic bomb gave us such power that we might have been able to refrain from its use.

We could have invited the Japanese Premier and the Swedish and Swiss Ambassadors to Tokyo to witness its demonstration in an unpopulated desert, and seen to it that their report reached the Japanese people. That would have started the bomb on the right career—as a liberator, not destroyer, of humanity.

If the Japanese surrender now, they would have surrendered from the demonstration in the desert, and peace would have started by an act of peace and the salvation of thousands of children's lives.

Like No Other Discovery I can recall no other discovery decisive for war which was invented primarily and specifically for war and thus found its first use. The two main weapons of this war so far—the tank and the bomber—are the outgrowth of genius in the service of peaceful development, for the conquest of distance and the air.

I hope it is still up to us to decide whether atomic disintegration shall continue to be used for destruction, or become, with its development, man's liberator from the very causes of war. Nature is neutral, and perhaps has no interest in man at all, or even in this particular planet.

A Greater Event Than the War At any rate, what happened last month in New Mexico and a few days ago in Japan is an event that puts this whole war into the background. Man has discovered the original source of all energy—the source that warms the earth and creates all its resources: the source that causes the sun eternally to burn.

To put it profanely, he has discovered the source of inexhaustible wealth. Two parables come to mind: The story of Prometheus, who stole fire from heaven and brought it to man to make him independent, and of the nature of God. And the story of the tower of Babel, which started as a bridge into the heavens, and to God, but which fell through the confusion of tongues.

Both are parables of the revenge of the gods. For men remained men—not good enough.

Everything's Outmoded With this invention everything we have hitherto done or even considered as a means of preventing war is completely outmoded. Every concept of checking aggression is inadequate. When atomic energy is further developed, along with jet propulsion, no power or combination of powers can check any aggressive state that has this weapon, and no state, however aggressive it may be, will attack another state which has it. Man is not made to fight atomic energy or to go to war against the sun.

The concept of dividing the world into two or three great power spheres, each with strategic thises or that, is childish. The concept of Balance of Power becomes a fairy-tale. If Switzerland had this weapon, and the Soviet Union did not, Switzerland would be more powerful than the Soviet Union.

A political deduction as logical as the instinct of self-preservation can immediately be drawn from this greatest of all human discoveries: There must be a world state. There cannot be several states or spheres each with sovereign power to do as it likes, and each, and eventually all, in possession of this weapon in various stages of development.

In the hands of any one power it can become, even without being used, a blackmailing instrument against all human liberty; in the hands of all, and uncontrolled, it will spell doom for mankind. It is not enough, after this, to control German and Japanese laboratories and industries.

All the laboratories and industries of the earth must be controlled and that is possible only if the world is under one control. We cannot live politically in the seventeenth century and scientifically in the fiftieth.

But since the root cause of all wars is fear of losing or hope of gaining means of subsistence or wealth, this discovery, that ultimately, if canalized in that direction, can provide inexhaustible sources of energy for all mankind, ends all reason for war, and its consequences should be total and universal disarmament. America has the greatest opportunity to save the world ever offered any people. It will not be hers forever.

ERA OF THE ATOM

Put Atomic Energy Under Public Ownership

It is not too soon to tackle the problems involved in the application of atomic energy to peacetime use.

It seems to us that so enormous a power for good, brought into being by a vast expenditure of Government funds, ought to be public property, under Government ownership from the very start. It seems to us that only Government ownership and operation can insure the full development and the wise use of atomic power.

The Canadian Government, though right-of-center politically, seems to have grasped this fundamental principle far better than our own. Some two years ago the Canadian Government nationalized Eldorado Mining & Refining, Ltd., the world's largest producer of uranium, and declared that all new discoveries of this precious ore would be the property "of the Crown," i.e., public property.

Undecided

But our own Government seems undecided, and that indecision may prove momentous. The only hint that President Truman gives as to his plans is that he will recommend to Congress "the establishment of an appropriate commission to control the production and use of atomic power within the United States." This is too vague for safety.

Mere regulation by a commission is not enough guarantee that the new discovery will be developed and applied in the public interest. We have an Interstate Commerce Commission to control the railroads—but the railroads control the Interstate Commerce Commission.

The principal companies involved in this new discovery seem to be Imperial Chemical Industries in England and duPont in America. Both are huge concerns, with commensurate political power, power great enough ultimately to control any regulatory commission set up to control them.

Both are associated with restrictionist policies, aimed to create profitable markets for their wares, sometimes at the expense of public welfare. Both were up to their necks in cartel deals with the Germans before the war, and documents published by the Justice Dept. have shown that both intended to resume these ties after the war.

Others Interested

The development of atomic energy is not a monopoly we can hope to keep for ourselves. The Germans, the Swedes, and the Danes, as well as the British and the Canadians, have been working on the problem of atomic energy for many years.

Put atomic energy here into private commercial hands and it will be essential for the company or companies involved to learn what their opposite numbers have discovered about atomic energy in other countries. It will be natural for them to make cartel and patent deals with each other, and these will again be carried on secretly and irresponsibly and in terms of private advantage rather than national policy and public need.

Producers of competing forms of energy, such as oil, coal, electricity, will seek to protect themselves by secret marketing agreements with the developers of

atomic energy. Some of these, such as the oil and power companies, may be big enough to stunt development of the atom.

The biggest problem in the use of atomic energy rises from the fact that in the prewar world the standard of living, even in such countries as the U. S. A., was too low to enable us to utilize the sources of power we already had. There was "overproduction" in oil, coal and electricity, and "overproduction" of grains—another source of energy.

The potential of atomic energy is so great that it constitutes a governmental rather than a commercial problem. The problem is to raise living standards to the point where all these new power possibilities can be utilized instead of curtailed or wasted. This can be done only under government ownership.

A glimpse of the danger involved merely in setting up a regulatory commission is provided by the Stimson statement on atomic energy. The Secretary of War announced the membership of an interim committee to consider the problems implicit in the new form of energy.

But all the members of this committee are men of conservative cast of mind. Those who are not themselves scientists are bankers, lawyers or big businessmen by profession. And those who are scientists are men friendly to the big monopolistic interests of this country.

Background

The public has had some experience with three of these scientists. Dr. Vannevar Bush, director of the Office of Scientific Research and Development and president of the Carnegie Institution, was before the TNEC early in 1939. His evasive testimony on the question of how foreign patent and cartel agreements restricted American production indicates how closely he is wedded to the big-business and monopoly point of view.

Two other members of the Stimson "interim" committee are Dr. James B. Conant, president of Harvard University and chairman of the National Defense Research Committee, and Dr. Karl T. Compton, president of the Massachusetts Institute of Technology and chief of the Office of Field Service in the Office of Scientific Research and Development.

Both are able men and no doubt have done valuable work in the war program. But their record on the Baruch rubber committee indicated that their judgment is not always to be trusted.

Their recommendations and conclusions were eminently satisfactory to Standard Oil, but events have proven them wrong on one major point after another. They were wrong in favoring rubber-from-petroleum over rubber-from-alcohol; most of our synthetic rubber has had to be made from alcohol, not from petroleum. One of the reasons for this is that the Standard Oil petroleum process they favored did not work well and developed many "bugs"

Misjudgment

Conant and Compton and Baruch were wrong in dismissing the fear that the Standard Oil rubber-from-petroleum process might conflict with the production of aviation gas. The rubber program

We repeat: the first essential in making certain that all the vast peacetime possibilities of atomic energy will be used in the public interest is to keep it under public ownership and development. And if we can really tap these possibilities of creating plenty, of raising living standards, not only for ourselves but for all the world, we shall have taken a long step, too, toward solution of that other problem made so urgent by the atomic bomb—the elimination of war.

—I. F. STONE

had to be shifted more and more to alcohol because the rubber-from-petroleum process did conflict with production of aviation gas.

The situation which faces this "interim" committee differs only in magnitude from that which faced the Baruch rubber committee. The oil interests were fearful of the vast competitive possibilities which organic chemistry has unlocked in grain.

The alcohol, furfural, butylene glycol and other solvents which can be made from grain are capable of producing the same range of fuels, plastics and synthetics which can also be produced from petroleum. The oil interests did their best to block and disparage any program for making synthetic rubber from grain, and the Baruch-Compton-Conant report supported the views of the oil propagandists in Washington.

But atomic energy promises to become a far more serious threat to the great oil combines than is grain, and one may be sure that they will fight to stifle or to take over this new potential competitor by every means in their power. One of these is their influence over the large Eastern technical schools, universities and scientific foundations.

The Comptons and Conants are typical of the kind of men who would be likely to sit on any Government commission to "control" private companies making atomic energy. And they are closer to the duPont and Standard Oil point of view than to the public.



Science and Civilization

By Edward R. Murrow

N. Y. Post Correspondent

London

For almost six years millions of Europeans have lived with the knowledge that their homes, their families, and their lives might be destroyed by explosives which came out of the sky. Life was uncertain; long-range planning seemed futile; war became a way of life—a mixture of resignation and recklessness.

People did not live as though they had a hundred years before them. Days and nights, friends, food, familiar streets, music and memories took on new quality and were more important because there was no promises that they could any longer be enjoyed at leisure.

But through it all, most people believed that somehow, sometime, the dangers would disappear—that victory would permit men to build homes, dream dreams, and live under skies that were beautiful and mysterious but not threatening. That hope has died. The sky has become a cannon's mouth. Humans have demonstrated that they can destroy humanity, and the world faces the question whether science is compatible with civilization.

Four Years of Awful Progress

Four years ago a single German plane dropped a single bomb about a block from where this is written. It weighed 2,000 pounds. It demolished one sturdy building, killing about 30 people. A dozen houses were consumed in the resulting fire and scores of buildings were severely damaged. One atomic bomb of the size dropped on

Samuel Grafton is on vacation

Hiroshima has an explosive force equal to 10,000 bombs of the size that struck that building four years ago. The mathematics are simple—any Londoner can figure it out for himself, and many have been doing so. The result is a sense of awe, uncertainty and almost desperation, which will leave its mark upon people and politics in every country that has experienced bombing so long as those countries exist.

Nothing Else Seems Important

Russia's declaration of war against Japan, the redrawing of the map of Europe, Britain's new Labor government seem scarcely to engage men's attention.

No statesman has been bold enough to predict that this is the last war. The settlement in Europe has been based on power. The powerful nations have created an organization and made laws from which they are exempt.

It is folly—it may even be suicide—to assume that this weapon will not be used in a future war. I remember too well the discussions at Geneva about limiting the use of submarines and bombers. When in all history has a nation, engaged in war, refused to use an available and effective weapon?

I know some of the scientists who were engaged upon this task, and the desperate sense of urgency which drove them on. Unless an equal degree of urgency and, if you like, fear can be developed by those responsible for the conduct of relations between nations, then most certainly within measurable time the pigs are going to inherit the earth—if there are any pigs left.

On Wednesday of next week the British government will announce its program for the coming session of Parliament. Those who expect startling, revolutionary proposals will be disappointed. Aside from the socialization of the Bank of England, the legislation proposed will follow the lines agreed upon by the coalition government. There will not be any proposal to nationalize the cotton industry.

I understand that Sir Oswald Moseley, Britain's homegrown Fascist leader who spent most of the war in jail, is now writing an explanation of why and where Fascism went wrong. Sir Oswald's literary efforts are not likely to result in a best seller.

(Copyright, 1945, New York Post)



The State of The Nation

We Who Made Bomb Must Control It

By Marquis W. Childs

Washington.

A few years back Thornton Wilder wrote a play called "Our Town." That play got closer to the root of things than most of the transitory scribbling which is done these days.

In the play, a young girl and her brother are sitting at the open window of their house in a little New Hampshire town, looking out at the stars in the night sky. For a moment they're touched with the wonder of it.

The young girl (this is set down from memory) is thinking about herself, one lonely individual in the mysterious vastness of the world. She recites her address for her brother: She lives on Maple Street in Hampton Corners, Crawford County, New Hampshire, U. S. A., the Earth, the Universe the Mind of God. The poetry of this, as done on the stage, was beautiful and moving far beyond the words themselves.

That blinding flash of light on the New Mexico desert and in crowded Hiroshima fills us with terror and horror. The cynic at the club round table said:

"Well, it's just like giving loaded machine guns to a cage full of apes and then turning them loose in the streets."

But it fills us with awe, and with wonder. It is like the feeling we have when we see a star fall across the night sky. It is like the feeling of the girl in Thornton Wilder's beautiful play.

The Sadness of Man

A crude hand, an ignorant, unknowing hand has grasped the stuff of which the universe is made. These scientists, for all that they produced this thing, are almost as ignorant of the root cause as are we ordinary mortals. You can read between the lines of the account of that testing on the lonely desert and see that they were not at all sure what was going to happen. Their conflicting reports on the effects of radiation after the bomb has exploded confirm their doubts.

It calls to mind the remark of a wise and philosophic Britisher who has seen this entire war

from the inside in Washington and London. At the center of power, he nevertheless seems to have been less corrupted by power than most individuals who are so exposed. He had just come from lunching—this was a year and a half ago—with three scientists who were working on the atomic project. He reported that conversation as follows:

"They tell me that perhaps they will not be able to stop the explosion when once they produce it; that quite possibly it will go on to tear apart at least the planet on which we live. I'm afraid I could not regret it too much. If that should happen, as I understand it, death would be painless and instant and those still unborn surely could not complain. Perhaps the human experiment has been a mistake."

He was not being either cynical or funny. He spoke out of the infinite sadness which came from his knowledge of the suffering and horror which man has inflicted on man in this terrible conflict.

It is the supreme tragedy of

this moment—that the new discovery, which dwarfs every physical achievement of the race until now, had to be used first for the destruction of human life. It was used to create more fear and hate. Women and children as well as men, undoubtedly by thousands, are still crying in agony and terror because the mind of man has unloosed the force of forces.

Responsibility

This is why those responsible for unleashing the new power must meet in solemn awe at once to control its use as the responsibility not of a nation or a group of nations, but of the race itself. The obvious suggestion has been made that the entire project be turned over to the new United Nations Organization.

It seems to me that this is too big a burden to pile on an organization not yet in being. We cannot wait until the new league is ready to take on such a load. Every moment that goes by increases the danger that this will become a matter of competition among all the nations.

The primary responsibility belongs to those who have evoked the new force. A working partnership of Britain, Canada, Australia and the U. S. did the job. Let responsible representatives from these countries meet at once to serve as trustees until the new league is prepared to take over.

Like curious children, we have forced the lock on the forbidden door. Now, unless we mean to destroy ourselves, we must guard the entrance.

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Scientists Warn Against Misuse of Power

(Copyright, 1945, by The Newspaper PM, Inc.)



CHICAGO, Aug. 9.— Abuse of atomic power would mean “the beginning of the end of the world” and if America allows it to engender international jealousies instead of international solidarity, “God help us all.”

This warning was issued today by scientists at the University of Chicago who took an active part in the creation of the earth-smashing atom bomb, but who must remain unnamed.

“It must be fully realized by this country and the world that what we do with this new power from now on is fraught with unbelievable consequences,” one of them said.

He added in warning language that “the world as we knew it no longer exists, and it is the devout obligation of America to know the

danger as well as the glory involved in atomic energy.”

While America may have no intention of using atomic power as a threat, he said “its very existence is a threat because it is now made and cannot be unmade, and we alone have it.”

With equal solemnity, Chancellor Arthur H. Compton, of Washington University in St. Louis, who directed research at the University of Chicago as dean of the Physical Sciences Division until this Summer, quoted former Prime Minister Churchill in saying:

“This revelation of the facts of nature long mercifully withheld from man should arouse the most solemn reflections in the mind and conscience of every human being. We must pray that these awful agencies will be made to conduce

peace among nations and, instead of wreaking measureless havoc upon the entire globe that they may become a perennial foundation of world prosperity.”

While secrecy continued to envelope details of the work done by the Chicago scientist, it was learned that the group worked with “feverish intensity” and in “mortal fear” that the Germans might beat America to the draw in perfecting the atom bomb.

When the news first reached America that the Nazis were using jet propulsion bombs, a great fear fell upon those in the project who knew what this might mean.

One man said:
“What did the jet bombs have in them? That’s what we wanted to know. If they had our explosive the war was over and Germany had won it. That’s how close it was.”

N.Y. TIMES
2D BIG AERIAL BLOW

Japanese Port Is Target
 in Devastating New
 Midday Assault

RESULT CALLED GOOD

Foe Asserts Hiroshima
 Toll Is 'Uncountable'
 —Assails 'Atrocity'

By W. H. LAWREICE

By Wireless to THE NEW YORK TIMES.

GUAM, Thursday, Aug. 9—Gen. Carl A. Spaatz announced today that a second atomic bomb had been dropped, this time on the city of Nagasaki, and that crew members reported "good results."

The second use of the new and terrifying secret weapon which wiped out more than 60 per cent of the city of Hiroshima and, according to the Japanese radio, killed nearly every resident of that town, occurred at noon today, Japanese time. The target today was an important industrial and shipping area with a population of about 253,000.

The great bomb, which harnesses the power of the universe to destroy the enemy by concussion, blast and fire, was dropped on the second enemy city about seven hours after the Japanese had received a political "roundhouse punch" in the form of a declaration of war by the Soviet Union.

Vital Transshipment Point

GUAM, Thursday, Aug. 9 (AP)—Nagasaki is vitally important as a port for transshipment of military supplies and the embarkation of troops in support of Japan's operations in China, Formosa, Southeast Asia and the Southwest Pacific. It was highly important as a major shipbuilding and repair center for both naval and merchantmen.

The city also included industrial suburbs of Inase and Akunoura on the western side of the harbor, and Urakami. The combined area is nearly double Hiroshima's.

Nagasaki, although only two-thirds as large as Hiroshima in population, is considered more important industrially. With a population now estimated at 253,000, its twelve square miles are jam-packed with the eave-to-eave buildings that won it the name of "sea of roofs."

General Spaatz' communiqué reporting the bombing did not say whether one or more than one "mighty atom" was dropped.

Hiroshima a 'City of Dead'

The Tokyo radio yesterday described Hiroshima as a city of ruins and dead "too numerous to be counted," and put forth the claim that the use of the atomic

Continued on Page 6, Column 3

**NAGASAKI BLASTED
 BY 2D ATOM BOMB**

Continued From Page 1

bomb was a violation of international law.

The broadcast, made in French and directed to Europe, came several hours after Tokyo had directed a report to the Western Hemisphere for consumption in America asserting that "practically all living things, human and animal, were literally seared to death" Monday, when the single bomb was dropped on the southern Honshu city.

The two broadcasts, recorded by the Federal Communications Commission, stressed the terrible effect of the bomb on life and property. European listeners were told that "as a consequence of the use of the new bomb against the town of Hiroshima on Aug. 6, most of the town has been completely destroyed and there are numerous dead and wounded among the population."

[The United States Strategic Air Forces reported yesterday that 60 per cent of the city had been destroyed.]

"The destructive power of these bombs is in describable," the broadcast continued, "and the cruel sight resulting from the attack is so impressive that one cannot distinguish between men and women killed by the fire. The corpses are too numerous to be counted."

"The destructive power of this new bomb spreads over a large area. People who were outdoors at the time of the explosion were

burned alive by high temperature while those who were indoors were crushed by falling buildings."

Authorities still were "unable to obtain a definite check-up on the extent of the casualties" and "authorities were having their hands full in giving every available relief possible under the circumstances," the broadcast continued.

In the destruction of property even emergency medical facilities were burned out, Tokyo said, and relief squads were rushed into the area from all surrounding districts.

The Tokyo radio also reported that the Asahi Shimbun had made "a strong editorial appeal" to the people of Japan to remain calm in facing the use of the new type bomb and renew pledges to continue to fight.

[A special meeting of the Japanese Cabinet was called at the residence of Premier Kantaro Suzuki to hear a preliminary report on the damage, The United Press said.]

A Propaganda Front

Voice broadcasts and wireless transmissions aimed at North America and Europe during the day apparently were trying to establish a propaganda point that the bombings should be stopped.

For example, a Tokyo English language broadcast to North America, accusing American leaders of fomenting an "atrocious campaign" in order "to create the impression that the Japanese are cruel people," as preparation for intensive Allied bombing of Japan, took up the subject of atomic bombing, and described it as "useless cruelty" that "may have given the United States war leaders guilty consciences."

"They may be afraid that their illegal and useless and needless bombing may eventually bring a protest from the American people

unless some means of hardening them can be provided," the broadcast continued.

The broadcast to the United States went on to ask: "How will the United States war leaders justify their degradation, not only in the eyes of the other peoples but also in the eyes of the American people? How will these righteous-thinking American people feel about the way their war leaders are perpetuating this crime against man and God?"

"Will they condone the whole thing on the ground that everything is fair in love and war or will they rise in anger and denounce this blot on the honor and tradition and prestige of the American people?"

The broadcast said that "authorized quarters in Tokyo made the following statement on Aug. 8 with regard to the United States disregard for humanity:

"International law lays down the principle that belligerent nations are not entitled to unlimited choice in the means by which to destroy their opponents.

"This is made clear by Article 22 of The Hague Convention. Consequently, any attack by such means against open towns and defenseless citizens are unforgivable actions. The United States ought to remember that at the beginning of the fighting in China it protested to Japan on numerous occasions in the name of humanity against smaller raids carried out by Japan."

[Article 22 of The Hague Convention of 1907 Respecting the Laws and Customs of War on Land states: "The right of belligerents to adopt means of injuring the enemy is not unlimited."]

The Tokyo announcer used the French phrase "villes demilitarises," or "open towns," although Hiroshima was known to be a quartermaster depot and a garrison town of considerable military importance.

The description of the havoc followed the line offered earlier in the broadcast to the United States, the "disastrous ruin" that struck the city, crushed houses and buildings, and "all of the dead and injured were burned beyond recognition," said the broadcast.

WHERE THE FIRST ATOMIC BOMB FELL



Aug. 9, 1945

The symbol on the map indicates the approximate spot, north of the docks, where the new explosive that wiped out 60 per cent of Hiroshima was dropped.

ATOMIC POWER

Beyond the veil of dust and smoke and searing death which was Hiroshima there are many fascinating fields of speculation for the use of atomic power for beneficent rather than destructive ends. The whole revelation of the fission of the atom has come with such a sudden thunderclap that one is left bewildered and at a loss to know which of its many implications beyond those of immediate destruction of the Japanese enemy may prove to be substantial and real, and which chimerical. Obviously a train of developments which involves many difficulties and complications must lie between the utilization of the explosive force of the atom for bombing and the chaining of this force and its channelizing to the ends of peaceful industry. It can be hoped, however, that the same intensive application and teamwork on the part of research and science which has marked the new development of the breakdown of U-235 for a weapon may result in many applications which would change radically the nature of our everyday lives.

Already scientists of the National Advisory Committee for Aeronautics have suggested that an end result might be a form of prime mover for aircraft which would so materially reduce the fuel load as to extend enormously the economy and efficiency of flight. William B. Stout, former president of the Society of Automotive Engineers, has indicated the possibility, through the use of atomic force, of an automobile engine no larger than a brick. In countless other fields of industry and transportation the events set in motion by the first trial of the new bomb at Alamogordo Airfield, New Mexico, and the first combat use at Hiroshima may be the first links in the chain of development profoundly affecting our whole civilization. Knowledge of the new power is still so circumscribed by the necessities of security and still so young in point of time that such projections must necessarily be highly speculative. But when we consider the speed, for example, with which the development of the turbo-jet engine has been brought to a point where it may make obsolete previous conceptions of applied power based on

the reciprocating principle, it does not seem too fantastic to assume that a future harnessed breakdown of the atom can have effects at present almost inconceivable on the industry and life of tomorrow.

ATOM RIVALS PETAIN IN FRENCH INTEREST

By Wireless to THE NEW YORK TIMES.

PARIS, Aug. 8—The atomic bomb caught up with and in some cases surpassed Marshal Henri-Philippe Pétain's trial today in the amount of attention that it received in the French press, where its military and industrial potentialities were equally discussed.

Assuming that its economic value would prove the more important in the future, the French News Agency said that "the Anglo-Saxon nations" had a double advantage in that their laboratories could so far apply atomic energy while most uranium, from which it is derived, was in Britain, Canada, America, South Africa and Australia, although there were deposits also in Austria, Madagascar, Portugal, the Congo and Russia.

Albert Grand cabled from New York to Liberation that three months ago Dr. Albert Einstein had said that, "unfortunately, the possibility of atomic disintegration is not entirely Utopian." Several writers here emphasized the bomb's appalling destructive power.

Combat commented that it was "indecent to celebrate a discovery that first serves the most formidable destructive power that man has held in centuries," especially in this world, which is "delivered over to violence, incapable of control, indifferent to justice and human happiness."

1945.

70-YEAR EFFECT OF BOMBS DENIED

Atomic Research Head Scouts Long Radioactivity—Expert Here Clarifies Statement

Special to THE NEW YORK TIMES.

WASHINGTON, Aug. 8—Dr. J. Robert Oppenheimer, director of the vast research project that developed the atomic bomb, today said there was no reason to believe the bomb explosion over Hiroshima left any appreciable radioactivity on the ground. Simultaneously, the War Department said other scientists who worked on the project similarly thought no such effect would result.

The statements were issued by the Department as comment on a newspaper story by Dr. Harold Jacobson that the bomb would leave killing radioactivity behind for seventy years.

"Based on all our experimental work and study and on the results of the test in New Mexico," Dr. Oppenheimer said, there is every reason to believe that there was no appreciable radioactivity on the ground at Hiroshima and what little there was decayed very rapidly."

The War Department said that in the opinion of "qualified experts" who had been studying the bomb from all phases, no such thing would happen.

All the scientists connected with the atomic bomb project had been pledged to secrecy, under the Espionage Act, it was said at the War Department, this including Dr. Oppenheimer, Dr. Jacobson and others. But, because the story was published under Dr. Jacobson's name, the Department asked Dr. Oppenheimer to furnish his views.

Dr. Jacobson Tells Views

Dr. Jacobson, a technician on the staff of Philip E. Wilcox, Inc., of 39 Park Avenue, which prepared

technical manuals for the Navy, issued a statement yesterday afternoon clarifying his position as the author of an article distributed by a newspaper wire service in which he declared that Japanese visiting the Hiroshima ruins would be in danger for seventy years. Dangerous secondary radiations would continue around the bombed city for that long, he had declared.

Dr. Jacobson was questioned for several hours yesterday by Government agents, including special agents of the Federal Bureau of Investigation, and a spokesman said later that he was ill and upset by the furore his article had engendered. His later statement follows:

"1. It should be clearly understood that my connection with the 'Manhattan Project' [the code name for the atomic bomb work] was in a minor official capacity.

"2. Naturally the material in this story represents my opinions, rather than confidential information.

"3. I find that as a result of later information eminent and qualified scientists connected with the project do not agree with some of my opinions.

"4. I am surprised and pleased to learn that the results of the July experiment in New Mexico indicate that only minor amounts of radioactivity are present after the explosion and that these quickly disappear.

"5. To my knowledge, the manufacture of atomic energy in the United States has been skillfully planned and provided with such efficient safety precautions that there is no danger to any of the employes on the 'Manhattan Project.'"

The spokesman said there was no question, as reported earlier in the day, of Dr. Jacobson's renouncing his earlier statements as having been written by someone else. He wrote them and cleared them through the Office of War Information in Washington, it was said.

ATOM HELD PEACE AGENT

Scientist Links Discovery to Necessity for Averting War

By DR. J. R. OPPENHEIMER

North American Newspaper Alliance.

SANTA FE, N. M., Aug. 8—The

All Foreign Sabotage Of Atomic Bomb Foiled

By The Associated Press.

WASHINGTON, Aug. 8—The Federal Bureau of Investigation said today that no foreign-directed sabotage had been committed at any atomic-bomb installation although German agents in this country had orders to get specific information on the bomb and on uranium.

German spies were directed to make contact with key personnel at atomic-bomb plants and to determine among other things the type of protective devices used, a Federal Bureau of Investigation spokesman said. This indicated that the Germans were encountering trouble in their atomic developments, he said.

The spokesman emphasized that no contacts had been made by the German agents with key employes of the plants. Special security measures were invoked to protect these individuals from physical harm, he said.

From a foreign power the Federal Bureau of Investigation learned that the Germans were inquiring about the Pasco, Wash., plant, the spokesman said. As a result, the Army took over the protection of this installation.

The Federal Bureau of Investigation studied 269,303 applicants' finger cards for the "Manhattan District Project" and found that 31,223 persons had criminal records worth investigating by the Army, the spokesman said. In addition, the Federal Bureau of Investigation investigated every person employed by the atomic-bomb development.

Task Posed for Us

TO THE EDITOR OF THE NEW YORK TIMES:

We have increased our control over energy and power 20,000 times and more. We know that if nations use this power within the atom in fighting each other we can, with new developments certain to come, destroy all animal life in a short time. Also we know that the social antagonisms—racial, national and economic—now brewing among men shall certainly cause another war.

Therefore, unless the United States, which first used atomic energy destructively, uses its relatively enormous power to increase by 20,000 times the power of the United Nations of the Earth, man shall destroy himself.

The United Nations must have even more power over all people on earth than the United States Government has over its people. Future developments may increase atomic power so that even a small group in the United States, operating secretly, could cause fantastic destruction.

I do not believe that there is enough unity and will among the world's leaders to create such a United Nations organization. Therefore, I believe the United States should use all its power to obtain military and political control.

If this is not done soon other nations will soon use atomic power themselves, and a world state will become an impossibility. ROBERT HARROW.

New York, Aug. 7, 1945.

Atomic Bomb Poses Problem

Intelligence Needed to Prevent Use of New Power for Destruction

TO THE EDITOR OF THE NEW YORK TIMES:

A creeping feeling of apprehension is felt throughout the world as to what, exactly, would be the use made of the discovery of the atomic power which was revealed after the dropping on Japanese soil of one of the most destructive weapons ever devised by the technological ingenuity of man.

The now man-harnessed terrific power of atomic energy poses for human beings the greatest of moral choices they have ever had to face—between educating themselves for doing good or allowing their latent bestial passions to bring total catastrophe upon themselves.

The United States and Britain are, for the present, in possession of a formidable secret and able to manufacture the weapon that could extinguish the lives of hundreds of thousands of people in a brief second or the machines that would improve the quality of performance of every motive-power mechanism and thus save many of the fast-being-depleted stores of fuel materials now employed for that purpose.

Thus the fate of humanity largely rests upon a course of wisdom or one of primitive ferocity the two great nations may choose to follow hereafter in world affairs.

The discovery, moreover, brings to a climax the urgency of placing only men of great vision and warm human understanding at the head of legislative bodies and foreign affairs offices. It is more on these two branches of government that laws and policies making for genuine cooperation or for friction with other governments may develop in the future.

On entering a new phase of stupendous energy-releasing discoveries for mechanical uses we must all feel obliged to devote our best intellectual energies to the development of social science and the science of government to that perfection that will enable them to meet successfully the many strange demands of a new and portentous era in human existence. May intelligence, warm sympathy and affection guide us safely through a future pregnant with possibilities for much good or for evil more hellish than any yet known.

A. GARCIA DIAZ.

New York, Aug. 7, 1945.

NO VATICAN STAND IS TAKEN ON BOMB

No Statement on Its View Is Likely Unless the Pope Speaks for Himself

By Wireless to THE NEW YORK TIMES.

ROME, Aug. 8—The Vatican as such has not taken any stand against the atomic bombing of Japan and in view of reports to the contrary yesterday this cannot be too strongly emphasized.

It is quite true that among the hundreds of priests in the Vatican a feeling of deep personal revulsion against the use of so awesome a weapon has welled up. It is true, also, that the Vatican in a collective sense has always deplored the inflicting of war's horrors on civilian populations and to that extent is likely to view the effect of the new weapon with dismay.

But for obvious reasons a formal statement of Vatican opinion on so moot a matter would not be forthcoming save from the Pope or the Secretariat of State. In any event it would certainly have been published in the Osservatore Romano, Vatican City newspaper, and disseminated through the daily bulletin of the Vatican press service directed by Federico Alessandrini, who is associate editor of the Osservatore Romano.

Signor Alessandrini said today that no such statement of policy had been authorized. Tonight's Osservatore Romano carries only a news round-up on the atom bomb. Strongly Catholic newspapers like the Popolo and the Quotidiano did not use yesterday's story although they are subscribers to the agency that distributed it.

It is also worth noting that the completely unofficial but deeply entrenched private agency run by Msgr. Enrico Pucci did not attempt to speak for the Vatican in this connection. Msgr. Pucci, who has been repeatedly disavowed as an authorized spokesman by high Vatican attachés, merely declared that the atomic bomb had made a "deep impression" on the Vatican.

The Conservative Agenzia Romana d'Informazioni, which is close to the Christian Democratic party and specializes in Vatican news, denounced the story as a "fantasy."

The Vatican in general prefers to remain, as one American attaché put it, "gray" rather than taking a stand that would make it "black" or "white" on contro-

versial matters involving international relations.

This certainly applies in the present case, as was shown by the way in which yesterday's Osservatore Romano discussed the atomic bomb. It will continue to apply at least until the Pope decides to speak for himself.

At the office of Myron R. Taylor, the President's envoy to the Vatican, a high ranking aide assured this correspondent that the Vati-

can had taken no official stand on the atom bomb.

Pope Denies Statement

ROME, Aug. 8 (P)—Pope Pius XII was quoted by an American newspaperman today as denying that anyone had been authorized to express the Vatican view on the use of the atomic bomb against Japan.

Newbold Noyes Jr., correspondent of The Washington Star, said

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that during a private audience the Pope granted him and Carleton A. Hardraker, correspondent of Newsweek, today they showed the Pontiff an Associated Press dispatch published in the Army newspaper Stars and Stripes, which said the Vatican opposed the use of atomic bombs on Japan.

[A Vatican City dispatch, which quoted "an authoritative Vatican source" as making a statement to that effect was issued by The Associated Press in the United States but was withdrawn from publication when the source would not permit himself to be named.]

Mr. Noyes said the Pope declared he had not been aware of any such statement. He added that the Pope used the telephone, presumably to check the source of the statement, then told the correspondents: "Yes, the statement was unauthorized."

Die Laufbahn Lise Meitners

Andere jüdische Mitarbeiter bei der Atombombe

Über Nacht hat der Name einer Jüdin, die Hitler mit seinen Rassengesetzen aus Deutschland vertrieb, die Runde um den Erdball gemacht. Die Atombombe, die soeben zum ersten Male mit fürchterlicher Wirkung an Japan erprobt wurde und von Präsident Truman und Premierminister Attlee sowie Winston Churchill in besonders feierlicher Form als ein Ereignis von welterschütternd-revolutionierender Wirkung und Tragweite, sowohl für den Krieg wie für den Frieden, hingestellt worden ist, beruht, was die Vorarbeiten angeht, zu gutem Teile auf den physikalischen Forschungen dieser jüdischen Refugee-Wissenschaftlerin und ihrer Mitarbeiter.

Ihr Name ist Lise Meitner. Wie die amerikanische und englische Presse übereinstimmend am Tage der Bekanntgabe des Einsatzes der Atombombe gegen Japan betont hat, wäre ohne die experimentellen Arbeiten Lise Meitners und ihrer Kollegen Hahn, Strassmann, Frisch und Peierls, die praktische Verwirklichung der ungeheuerlichsten Waffe der Neuzeit kaum möglich gewesen.

Die Laufbahn der Forscherin

Wer ist Lise Meitner? Die Forscherin, die in deutschen und internationalen Gelehrtenkreisen längst eine Berühmtheit war, ist am 7. November 1878 in Wien geboren, mithin bereits 67 Jahre alt. Nach einer Privatdozentur in Berlin wurde Lise Meitner ausserordentlicher Professor für Physik an der Universität Berlin und Mitglied des Kaiser Wilhelm-Instituts für Chemie in Berlin-Dahlem. Hier war ihr Hauptarbeitsgebiet die Radioaktivität. Sie untersuchte die Zerfallsprodukte des Radiums, Thoriums und Aktiniums sowie das Auftreten der Beta-Strahlen. 1918 entdeckte sie gemeinsam mit Otto Hahn das Protaktinium. Ferner lieferte sie in den letzten Jahren vor Hitler fundamental wichtige Beiträge zur Physik der Atomkerne.

1935 wurde Prof. Dr. Lise Meitner von den Nazis als "Nichtarierin" ihrer Lehr- und Forschungstätigkeit enthoben und aus dem Lande gejagt. Sie ging erst nach Dänemark, wo sie 1939 am Institut für theoretische Physik in Kopenhagen ihre ungeheuer bedeutungsvollen Experimente zusammen mit Dr. Otto Robert Frisch ausführte, die sie dann in einer Abhandlung in den Mitteilungsblättern der Kgl. Dänischen Wissenschaftlichen Gesellschaft ausführlich im Jahre 1939 beschrieben hat. Von Kopenhagen ging Prof. Meitner nach Stockholm, wo ihr ihre Arbeiten über die Entbindung der Atomenergie seit 1938 die Mitarbeit in der Schwedischen Akademie der Wissenschaften eingetragen hatten.

Prof. Dr. Lise Meitner hat die Ergebnisse ihrer Forschungen zur Zertrümmerung der Atome in einer Reihe von Schriften und Abhandlungen niedergelegt, die wegen ihres rein wissenschaftlich-technischen Charakters im wesentlichen nur dem Fachmann verständlich und deshalb dem grossen Publikum wenig oder garnicht bekannt geworden sind. Wir nennen hier die grundlegenden Arbeiten Prof. Meitners, aus denen wir weiter unten einige Auszüge wiedergeben: "Beiträge zur Physik der Atomkerne"; "Atomvorgänge und ihre Sichtbarmachung" (1926); "Der Aufbau der Atomkerne" (1935 zusammen mit Prof. Max Delbrück; "On the Products of the Fission of Uranium and Thorium Under Neutron Bombardment" (1939, Kopenhagen, zusammen mit Dr. Frisch).

In der letztgenannten Abhandlung, die nur in englischer Sprache vorliegt und in Band XVII, Nr. 5 der Mathematisch-Physikalischen Mitteilungen der Kgl. Dänischen Wissenschaftlichen Gesellschaft aus dem Jahre 1939 zu finden ist, hat die jüdische Forscherin die genaue Schilderung ihrer Experimente über die Verwandlung von Uranium und Thorium durch Neutronen-Bombardierung gegeben. Zum besseren Verständnis der Auszüge aus dieser Darstellung sei hier vorweg erklärt, dass "Isotope" in der neueren Physik die übliche Bezeichnung von Elementen oder Atomarten ist, die an gleicher Stelle im Periodischen System der Elemente stehen. Sie unterscheiden sich lediglich durch die Verschiedenheit ihrer Atomgewichte, d. h. ihrer Kernmasse. Durch die Entdeckung der Isotope hat das Atomgewicht in der Chemie seine beherrschende Stellung verloren und an die Kernladung abgegeben. Unter "Isomerie" (Isomerism) wird in der Chemie die Erscheinung verstanden, dass chemische Verbindungen bei gleicher qualitativer und quantitativer Zusammensetzung sich chemisch und physikalisch unterscheiden.

Im Kopenhagener Laboratorium

In der Kopenhagener Abhandlung über die Experimente, die die Grundlagen für die Atombombe schuf, führt Prof. Lise Meitner u. a. aus:

"The first experiment of Fermi on the transmutation of uranium and thorium by neutron bombardment already disclosed several interesting new features, which were investigated more closely in the following years especially by Hahn and Meitner, and Hahn, Meitner and Strassmann. In the case of uranium, ten different radioactive bodies were found to result from the transmutation. In the case of thorium, six transformation products with chemical properties similar to those of radium and actinium were found, apart from a radioactive thorium isotope, which is probably converted into a protactinium isotope. . . .

"Following the remarkable observation by Curie and Savitch of the occurrence of transmutation products of uranium chemically similar to rare earth elements, Hahn and Strassmann

found . . . some further uranium products with unsuspected properties. These products were at first believed to be isotopes of radium and actinium; by careful chemical tests, however, it was found later that they were actually isotopes of barium and lanthanum. Thus it was necessary to assume the existence of an entirely new type of nuclear reaction, the splitting of the uranium nucleus into much smaller nuclei. . . .

"This new type of nuclear reaction can be simply understood on the basis of the general ideas of the mechanism of nuclear transmutation developed in later years by Bohr. According to these ideas, a nucleus behaves in many respects similarly to a liquid drop, and the new type of transmutation, for which we proposed the name "fission," may therefore be compared with the division of such a drop into smaller droplets as a result of a deformation produced by an external disturbance. For highly charged nuclei, such a deformation will in fact require a relatively small energy, since the restoring influence of the surface tension arising from the short range nuclear forces will be largely compensated by the electrostatic repulsion of the separating fragments of the nucleus. In the course of the separating process, this repulsion will moreover give the fragments very large kinetic energies. . . . Just on account of this large energy release, direct experimental evidence of the fission processes was also soon obtained partly by the observation of the large ionisation produced by each of the high speed nuclear fragments, partly by the possibility of separating the new products from the bombarded uranium and thorium, afforded by the power of the high speed fragments to penetrate through thin foils of solid matter."

Mitarbeiter Lise Meitners

Wir haben schon oben darauf hingewiesen, dass Prof. Lise Meitner die Experimente, deren allgemeine Natur die vorstehenden Zitate kennzeichnen, in Gemeinschaft mit Dr. Otto Robert Frisch ausgeführt hat. Dieser ist, wie wir erfahren, der Neffe der Forscherin und ebenfalls in Wien geboren. Dr. Frisch war vor seinem durch Hitler erzwungenen Verlassen Deutschlands Dozent an der Universität Hamburg, ging zunächst nach London, um seine Forschungen über Kernphysik fortzusetzen und arbeitete dann in Kopenhagen am Institut von Prof. Niels Bohr. Dort entwickelte er mit seiner Tante, wie oben geschildert, die Theorie der "nuclear fission". Frisch wurde 1943 britischer Bürger. Er ist heute 41 Jahre alt.

Ebenso hat nach englischen Mitteilungen der noch jüngere, erst 38 Jahre alte, Prof. Rudolf Ernst Peierls, ein jüdischer Refugee aus Berlin, ein hohes Mitverdienst an der Entwicklung der Atombombe. Peierls, seit 1940 britischer Bürger, ist heute, wie der britische Informationsdienst hervorhebt, "einer der hervorragendsten theoretischen Physiker in England". Er gehörte von Anfang an zu den Mitgliedern des von Churchill und dem britischen Generalstab eingesetzten Komitees zur Entwicklung einer Atombombe. Ein Rockefeller Stipendium und die Berufung auf den Lehrstuhl für angewandte Mathematik an der Universität Birmingham bezeugen die Anerkennung, die seine wissenschaftlichen Arbeiten in England gefunden haben. Peierls ist seit diesem Jahre auch Mitglied der Royal Society, der weltberühmten und führenden wissenschaftlichen Körperschaft Grossbritanniens.

Drei jüdische Namen: Lise Meitner, Robert Frisch, Ernst Peierls . . . drei, die Hitler in seiner Stupidität aus Deutschland hinaustrrieb. . . .

Und ihnen muss noch ein vierter jüdischer Name hinzugefügt werden. Der des amerikanischen Professors Dr. J. Robert Oppenheimer. Dieser in New York am 22. April 1904 geborene, von deutsch-jüdi-

schen Eltern stammende Gelehrte, der in Harvard und Göttingen studierte und an dieser deutschen Universität seinen Doktorgrad erwarb, ist heute Direktor des California Institute of Technology. Er gilt als einer der hervorragendsten Spezialisten Amerikas auf dem Gebiet der Kosmischen Strahlen und der Atomphysik.

Oppenheimer hat das Labora-

torium geplant, organisiert und geleitet, das in der Nähe von Santa Fe, N.M., die Atombombe zu praktischer Verwendung im Kriege entwickelte. Von ihm sagt Kriegsssekretär Stimson rühmend: "The development of the bomb itself has been largely due to his genius and the inspiration and leadership he has given to his associates."

Richard Dyck.

Ein sensationelles Dokument

Deutsche Offiziere bezeugen deutsche Greuelthaten
von Major EUGEN KUMMING-München,
ehemaligem Offizier beim Oberkommando des deutschen Heeres

Seite 3

6. August 1945

Der sechste August des Jahres Neunzehnhundertfünfundvierzig wird in der Geschichte der Menschheit fortleben, wie kaum ein anderer Tag in der Historie dieses Planeten. Scheu und Grauen, Ehrfurcht und Fassungslosigkeit muss sich in jedem Menschen zu einem Tumult der Gefühle und der Gedanken mischen, der die Offenbarung der Entdeckung der Sonnenenergie miterlebt hat. Noch kann niemand voll erfassen, was geschehen ist. Aber eines steht fest: unser gesamtes politisches, soziales, medizinisches, wissenschaftliches Denken und Leben wird damit — wenn auch allmählich — auf andere Grundlagen gestellt werden. Am 6. August 1945 hat eine neue Epoche der Menschheit begonnen.

Die Entfesselung des Atoms ist nicht mehr und nicht weniger als die Entfesselung der Kräfte, aus denen das Weltall entstanden ist und lebt. "Oh, dass ich erkenne, was die Welt im Innersten zusammenhält" — dieser Sehnsuchtsruf Fausts, der am Ende alles seines vergeblichen Wissensdranges sich auf den Selbstmord vorbereitet, hier ist er erfüllt worden.

Sind die Menschen darauf vorbereitet? Diese neue Macht aller irdischen Mächte ist in Gestalt einer Flieger-Bombe zuerst in Erscheinung getreten, in ihrer Eigenschaft als eine zerstörende Macht. Wir wissen heute, dass wenn die Alliierten diesen Wettkampf der Laboratorien nicht um fünf Monate gewonnen hätten, viele von uns wohl heute nicht mehr lebten, dass New York vermutlich nichts weiter wäre als eine Kraterlandschaft. Aber nicht eine verwüstete Stätte wie es heute drüben in Europa Tausende gibt, mit ragenden Ruinen und mit kleinen Oasen des Lebens dazwischen, sondern nichts als eine Leere. Denn der Staub der atomisierten Stadt wäre längst im Winde verweht. Man weiss heute auch, dass Afrika-pläne der Deutschen für einen raschen Vorstoss nach Belgisch-Congo vorlagen, wo sich neben den von der kanadischen Regierung übernommenen Eldorado Goldminen im Great Bear Lake-Gebiet in Kanada die grössten Vorkommen an Uranium befinden.

Die Welt hält seit dem 6. August Tod und Leben in ihrer Hand. Niemals hat sich das menschliche Hirn bändigen lassen. Immer tiefer ist es in die Geheimnisse der Natur eingedrungen. Jetzt hat es das bisher grösste gelöst. Wird die Menschheit sich nun selber auflösen? Wird es ihr gelingen, die Elemente, die es nun beherrscht, zu bändigen? Wird es verhindert werden können, dass diese in die Hände von Menschen fallen, die sie in Cäsarenwahn, in Mordlust, in Tollheit an sich reissen?

Je mehr man über das nachdenkt, was hier geschehen ist, desto mehr verirren sich die Gedanken in Räume, die bisher ausserhalb der Grenzen aller Phantasie gelegen haben und die ja auch erst durch dies Geschehen in wahrstem Sinne des Wortes denkbar wurden. Es gibt nur noch die Wahl: Frieden oder Vernichtung. Jede politische Isolation hat aufgehört. Es gibt grundsätzlich bald keine grossen Staaten und kleinen Staaten mehr. Bevölkerungszahlen spielen bald kaum noch eine Rolle. Ich weiss nicht, wie bald — und bald sind zwanzig, dreissig Jahre —

...räume also. Der Begriff der Ozeane, ist schon in diesem Zusammenhang herabgesunken, Jetzt wird es anders werden. Internationale Rohstoffe wie Kohle, Oel, Wasserkraft — werden Schritt für Schritt erbeutet. Die Staaten daraus resultierend werden als gesamte physikalische Denken revolutioniert werden. Und damit in Frieden der Entwicklung weiter kommen auf. Die Tore des Weltalls Unendlichkeit tut sich dem Ersten auf. Wird man jetzt die Tore öffnen? Wird man Getreide aus Norwegen in eine Tropenzone verschieben? Werden die Menschen höher kultiviert? Wird die weltweite waltigste Sprung gewagt und ge-

AUFBAU RECONSTRUCTION

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Der Beginn Atom-Zeit

Von ARNO BRASCH

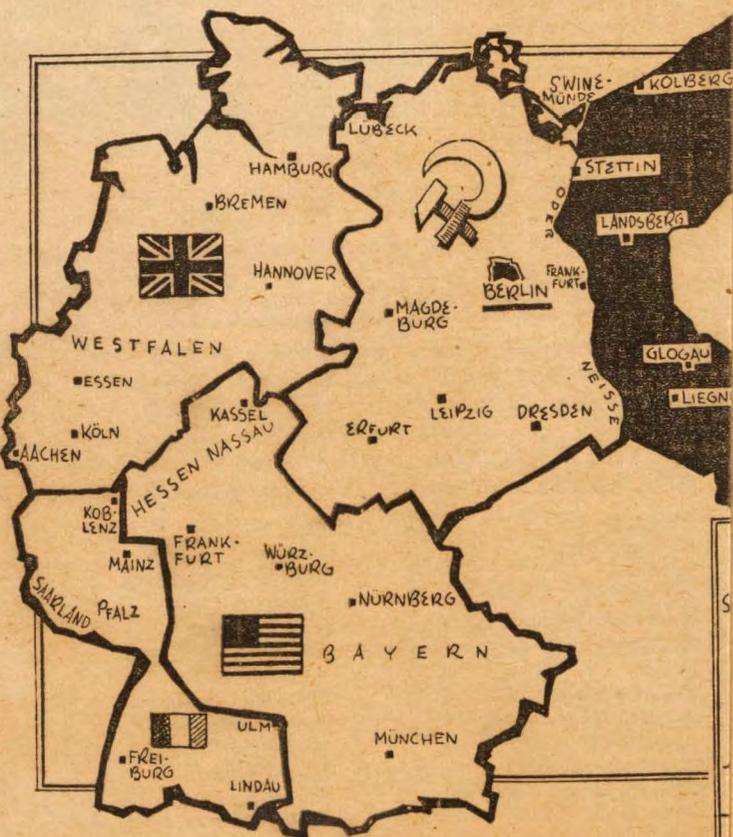
Der Autor dieses Artikels, Dr. Arno Brasch, ist der berühmte Atomphysiker, der zusammen mit Fritz Lange die Atomzertrümmerung mit künstlichen Mitteln begonnen hat. Besonders bekannt wurde er durch seine Versuche auf dem Monte Generoso, wo er aus Gewittern grosse Energien und Spannungen für die Atomzertrümmerung herauszuholen suchte. Brasch und Lange waren es auch, die als Erste die künstliche Radioaktivität untersucht und festgestellt haben. 1933 verliessen beide Deutschland. Brasch ging nach den Vereinigten Staaten, Lange nach Russland. 1938 arbeitete Brasch mit Joliot und Irene Curie in Paris an einem Atomzertrümmerungsapparat, den dann die Curies weiter benutzten. 1939 ging Brasch an das Californische Institut für Technologie in Pasadena. Zur Zeit ist er in New York mit Versuchen einer neuen Strahlenchemie beschäftigt. In der "N. Y. Times" schrieb vor einiger Zeit Waldemar Kaempfert über Brasch: "There is no doubt in my mind that Brasch's pioneering may constitute the basis of entirely new electronic industries."

Der sechste August 1945 gehört in den Kalender der Sternstunden der Menschheitsgeschichte.

Die dramatische Erklärung unseres Präsidenten über die endlich gegückte Erschliessung atomarer Energien beendet eine ökonomische und industrielle Epoche, die

mit der Erfindung der Dampfmaschine begann. Gleichzeitig kündigt der Präsident eine neue Ära unbeschränkter industrieller Anwendungsmöglichkeiten von solcher Tragweite an, dass selbst die Fachleute noch zu erschüttert sind, um in allen Einzelheiten das Geschehene zu würdigen und zu er-

Das neue Deutschland und das neue



Wenn auch die Beschlüsse von Potsdam die endgültige Entscheidung der kommenden Friedenskonferenz überlassen, so wird bis dahin zum mindesten im Osten ein fait accompli geschaffen worden sein. Der "provisorische" Zustand dürfte dann nur noch formal in einen dauernden verwandelt werden. Die Karte zeigt die Verteilung der Macht und

Norse Paratroopers Blew Up Nazi Atomic Bomb Factory

Band of Nine Patriots Destroyed Germany's Heavy Water Plant in Valley.

By WENDY MacGOWAN.

Staff Correspondent of THE NEW YORK SUN.
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Rjukan, Norway, Aug. 7.—The failure of the Germans to perfect and produce an atomic bomb for the utter destruction of London doubtless was caused by the heroic exploit of Sverre Haugen, one of a band of young Norwegians who destroyed the German plans.

It is possible that they saved the world from the horrors of a powerful new secret weapon falling into Axis hands. Rjukan is in what is called locally the "Valley of the Moon." It is the scene of a vast Norwegian hydro-electric project including the largest direct electric current plant in the world. Its wartime interest and importance springs from the fact that it manufactures "heavy water."

For Generating Heat.
"Heavy water" may yet prove revolutionary in industry. Hitherto its use has been primarily for medical research, but the Germans commandeered four tons from Rjukan, a sufficient amount for their experimental research in efforts to build atomic bombs. Norwegian scientists used heavy water for the generation of the most intense heat.

The assistant chemical engineer at the project, Kjell Nielsen, said that the product itself had no explosive qualities, but the Germans used it as a catalytic agent through which to split the uranium atom, hoping to devise a way to harness the atom's energy and use it in bombs of great destructive power. They succeeded only partially in these experiments.

Nielsen said that the Norwegians and Germans knew of American and British progress along this line. He explained that heavy water definitely can be used as a source of energy, since it does not deteriorate or change its chemical properties.

New Horizons Open.
A minute quantity of the product, obtained through the use of heavy water uranium, could drive ships across the Atlantic for two years' continuous operation. It takes six months to produce the water, which from start to finish requires thirteen different processes. Its application in industry would open up vast new fields, it is believed.

The Germans, in their experiments, never achieved an explosive from the split atom, but they succeeded in revolutionizing their robot bombs. The major weight of the buzzbombs was fuel. With energy produced from the split atom, fuel could have been reduced to a minute quantity, leaving the rest of the weight for explosives.

It was explained that this was the chief use to which the Germans planned to put atomic bombs. They would have been able to travel a vast distance and would have possessed colossal damaged power. The chief obstacle of splitting the atom was the lack of control, hence the terrible danger in experimentation.

Problem for Allies.
The problem for the Allies was to get the heavy water apparatus blown up, leaving the plant intact. Rjukan is at the head of a wild valley, where winter gales blow trains right off their tracks. Snow-capped Gausta, the highest mountain in southern Norway, overlooks the town and plant. The project was built on the slope of Gausta, down which course scores of powerful waterfalls, whose energy is harnessed

BELIEVED SITE OF NAZIS' ATOMIC PLANT



Associated Press Wirephoto.

This hydroelectric factory at Rjukan, in Norway, is said by the Norwegian Information Service to have been used as an experimental station by the Nazis in their quest of an atomic bomb. The news agency said that the occupying Germans made their tests there until the Norwegian underground wrecked the plant in 1944.

NAVY IS STUDYING ATOM BOMB'S USE

Washington, Aug. 8 (A. P.).—The Navy expects the principle of the atomic bomb to be extended in time to naval shells and rockets.

This would give these already hard-hitting weapons terrific new power. A single shell hit which a modern dreadnaught could easily take new might, for instance, tear it to fragments if the shell carried the explosive power of the atomic bomb.

A navy spokesman, discussing the subject today, declined to hazard a guess as to what the discovery of how to release atomic energy might mean eventually to naval warfare.

He recalled, however, an instance when an ammunition ship blew up from a torpedo hit. The underwater concussion wrecked the steering gear of a destroyer well-removed from the scene.

Undoubtedly, he conceded, an atomic bomb dropped into the

water close to a fleet could cause great damage.

On the face of it, surface ships would appear at this stage to be highly vulnerable to high-flying planes carrying atomic bombs. All this may change, however, when anti-aircraft guns are enabled to throw atomic shells back and fill the skies with a concussion no present-day plane could withstand.

The spokesman said that the atomic bomb, had it become available earlier, would have been a great aid to the Navy in the island campaign it had to wage to carry the war to the Japanese homeland.

SHATTERING BOMB WAS NOT LARGE

By Associated Press.

The shattering atomic bomb that hit a new high in destruction at Hiroshima may have been far smaller than at first believed, a censor-approved Associated Press dispatch from Guam indicated today.

It referred to the bomb as "small enough to be carried by any American bomber or fighter planes," yet doing the work of 150 Superforts each dropping seven tons of incendiaries and demolition bombs—1,050 tons. This would be progress in reverse from the blockbusters of the European campaign.

June 8/8

TRUMAN FINDS APPREHENSION OVER NEW BOMB

Jubilation in Washington Gives Way to Fear of Political Impact.

CAPITAL SEEMS OPPRESSED

Government Agencies Begin to Evaluate Programs in Light of Atomic Age.

By PHELPS ADAMS.

Special to THE NEW YORK SUN.
The New York Sun Bureau,
Washington, Aug. 8.

President Truman, returning to his White House desk today, found the national capital more apprehensive than jubilant over the terrifying success of the atomic bomb which has fallen with almost as devastating an impact upon political thought here as it has upon the Japanese military base at Hiroshima.

For forty-eight hours now, the new bomb has been virtually the only topic of conversation and discussion in Washington as men in every branch of the Government have sought to recast and re-evaluate their programs for the future in the light of this revolutionary entrance into what is now acclaimed as the "atomic age." For two days, it has been an unusual thing to see a smile among the throngs that crowd the streets, and a good wisecrack would be as out of place here as at a funeral.

The entire city is pervaded by a kind of sense of oppression and among many persons there is a sense of fear that forces some to admit—a little shamefacedly—that they would be happier if this \$2,000,000,000 gamble had failed and if the knowledge humanity has just gained in the laboratory could somehow be bundled up in a sack and lost in the river like an unwanted kitten.

Could Destroy Mankind.

During this period many additional facts about the terrors of atomic bombing have seeped out, despite censorship rules preventing their publication, and have been passed along by means of the overworked capital grapevine. The first published information concerning the deadly radio-active after-effects of these explosions was revealed locally here in the Washington Post this morn-

ing in an article written by one of the scientists who worked on the bomb project.

Most disturbing to the capital, however, is the realization that mankind—after a couple of million years of determined effort—has actually and conclusively achieved the power to destroy himself and the earth upon which he lives. He can now build a bomb which will disintegrate the atmosphere surrounding this entire planet. They also realize that had this power fallen unluckily into the hands of a madman like Adolf Hitler, it would have been used for that purpose in the last tragic hours before the Nazis went down to defeat.

Twenty-four hours ago, members of Congress were earnestly debating among themselves whether or not the new discovery should be given to the United Nations Security Council and to other Allied governments. Today their thinking is growing up, and they are beginning to comprehend the fact that even if the blueprints and formulæ for this new invention were to be destroyed, the scientists of other nations would discover the secret anew in their own laboratories.

Other Nations Will Get It.

Our military and naval leaders realize that within a few years at best other nations will have atomic explosives of their own, no matter how closely we guard our knowledge. We can no more prevent that than Leonardo Da Vinci could prevent the invention of the submarine by merely destroying his own plans for one as he did a few centuries ago.

More awesome still is the realization that the political development of the world has not kept pace with its scientific knowledge—that we know of no way to prevent the misuse of this new discovery. The thought of negotiating an international series of treaties renouncing the use of atomic explosives in war inspires no confidence in any one.

Treaties renouncing the use of poison gas were executed after the last war, yet there is dependable evidence that the Japs used gas in China, and the only reason that it has not been widely used by the Axis Powers in this war is that both Germany and Japan were fully aware that the Allied nations were ready to retaliate instantly in kind, and that our gases were better and more abundant than theirs.

Fear Another Pearl Harbor.

With the atomic bomb, however, the power to retaliate can have no deterring effect. One Pearl Harbor sneak attack with atomic explosives in the next war, and there will be no victim left to retaliate.

Particularly frightening is the manner in which the three great inventions of this war lend themselves to a combination that will prove the complete engine of destruction in the next. Within a few years, certainly, it will be

possible to produce a rocket that will reach any section of the globe from any other section. It will be possible to aim that rocket with perfect accuracy by radar control. It will be a simple matter to load the rocket with atomic explosives. And a whole war has begun and ended in a single blinding flash.

All of this adds up to the one comprehensive realization that the world can never survive another war. The atomic bomb has put the Japanese up against the proposition of making peace or committing suicide, but it has put the entire world up against virtually the same proposition.

Against the stern necessity for maintaining peace forever, the United Nations charter in its present form affords but puny hope—even to some of those who most earnestly championed its ratification. The capital here is beginning to understand that it is not sufficient for the strong nations to keep peace among the little nations. They must keep the peace among themselves as well. Nor can peace be maintained—as the charter contemplates—by the use of force, because force means war, and war means total devastation of the earth.

These are the doubts and fears with which President Truman finds himself confronted as he returns to his desk today. This is the task that has blunted Washington's interest in his report on the Potsdam conference, and even in the immediate effect of the bomb upon the outcome of the Japanese war.

Uranium Was Named for Uranus, Father of Forces of Destruction

When the metal uranium, constituent of the deadly atomic bomb, was discovered and named by Klaproth in 1789 (in honor of the newly discovered planet Uranus), the scientist scarcely could have realized how appropriate the name some day would prove to be.

In Greek mythology, the god Uranus was the personification of heaven, and by Ge, the earth, had as children the Titans, the Cyclops and the Furies. The Titans, primordial beings of enormous strength, are typical of the power of force. The Cyclops were one-eyed giants who forged thunderbolts for Zeus. The three Furies were Tisiphone, the avenger of blood; Alecto, the implacable, and Megæra, the quarrelsome.

Now the modern Uranus, wed to earth, again spawns children whose power forges thunderbolts and who form a legion of avengers for Pearl Harbor.

Atom Explained for the Layman

Science Expert Breaks Down Technical Expressions With Simpler Terminology.

By HOWARD W. BLAKESLEE,
Associated Press Science Editor.

Here is a layman's description of the scientific terms which have been variously used in discussions of the atomic bomb which was dropped on Japan:

Atoms are the units of which all matter is made. There are ninety-two different kinds of these atoms, one for each of the ninety-two chemical elements. These ninety-two elements range from hydrogen, lightest in weight, up to uranium, which is the most massive. In between lie carbon, tin, iron, gold, radium and all the other known substances in the universe.

Every one of these ninety-two different kinds of atoms is made of exactly the same kind of small particles. The only difference between one atom and another is in the number of particles. Hy-

CAN STORE ENERGY

Richland, Wash., Aug. 8 (A. P.).—Major Joseph F. Sally, 32, chief of production at the Hanford Engineer Works said last night that the supply of atomic energy could be stored safely in "large quantities. It won't spoil in storage."

Not a visitor yesterday got closer to the production works than the city limits of Richland, twenty-six miles away, but officers in charge of the press visit promised a tour of the project area today.

Harry D. Riley, 37, of New York city, chief of services, said Richland cost \$50,000,000 to build from "sagebrush to city."

drogen, for example has three particles and uranium more than 100.

The particles are electrons, which are negative bits of electricity; protons, which are positive bits of electricity, and neutrons, which have no electrical charges. Protons and neutrons both are nearly 2,000 times heavier than electrons.

All Made in Same Pattern.

Every one of the ninety-two atoms is made in the same pattern. Each one has a center like the sun with electrons circling around it as the earth and other planets circle around the sun. The atom's sun is made up of protons and neutrons. The particles in each atom are held together by electrical attraction. These forces are relatively tremendous. They are so great that it is almost impossible to damage an atom of any kind.

Smashing Is Misnomer.

Splitting or smashing an atom means an attempt to knock out some of its electrical or non-electrical particles. This splitting is done by directing rays of millions of volts in electrical energy against atoms as targets. The rays usually are made of some of the particles that compose an atom, that is either electrons, protons or neutrons. Sometimes X-rays will damage an atom.

Smashing an atom is a misnomer. Atoms are so tough that no atom has ever been smashed by human means. The best that has been done has been to knock a few of the particles out of an atom like chips chopped out of a tree.

Only one atom has ever been split. That atom is uranium 235. Uranium atoms when bombarded

in the form of electrical voltage. That voltage is the energy which makes the present atomic bomb. Whenever the smaller chips that are knocked off from the other atoms break loose the electrical energy that held them in the atom is released in the form of electrical voltage. But in all of this chipping only small amounts of energy are obtained.

by the right kind of neutrons break into two nearly equal parts.

When uranium splits in two, some of the electrical attraction that held it together is given off

Curies Claim First Atomic Research

By the Associated Press.

PAIMPOL, France, Aug. 9.—Scientist Frederic Joliot-Curie, son-in-law of Pierre and Marie Curie, the discoverers of radium, issued this statement today:

"The use of atomic energy and the atomic bomb had its inception in the discoveries and work at the College of France in 1939-40 by Mr. and Mrs. Joliot Curie, Halban and Kowarski."

Atomic Bomb Seen Speeding End of War on Japan.

Washington, Aug. 8.—There is no sense of jubilation or even of triumph here over the development of the atomic bomb. There is a sense of horror and of reluctance to use the weapon to destroy Japan.

The hope is that the Japanese militarists will see that the discovery really gives them a way out of their dilemma and that negotiations leading to the occupation of Japan may be begun soon.

But nobody here seems able to fathom the possible reaction of the Japanese leaders to the bomb. Its destructive power sounds so incredible that it may be that several more bombs will have to be dropped before the Japanese realize that the broadcasts are not as fantastic as they must sound.

The Japanese, of course, don't know whether we have one bomb or a large quantity and they cannot be sure whether the whole thing isn't just a means of inducing their surrender and thus avoiding an invasion by our forces. But in due time the Japanese will discover that there are plenty of bombs to continue the destruction.

So it may be that the end of the Japanese war is merely a matter of weeks now, if not days.

Certainly the frightfulness of the bomb has produced already on this side of the ocean psychological repercussions that make one wonder whether the device to end all wars, so long predicted, has now finally materialized. When a war weapon becomes so easy to manufacture that it can be used by either side, there is apt to be non-use. Thus gas was used in the first world war but not in this war.

The fact that the United States would not use gas but has used the atomic bomb disposes of any argument that humane consideration prevented the use of gas by us in the Pacific war. It would appear now that the United States believed the Japanese would use gas in China where the latter's armies are not equipped to fight it and that the rise of gases might be detrimental to our own forces on such small islands as Iwo Jima because of changing winds. Whatever the reason for non-use of gas, the

atomic bomb emerges as far more deadly than any gas bomb ever invented.

American public opinion at the moment is quick to insist that any or all measures be taken to end the war against the Japanese. But a sober, second thought will come eventually and the responsibility for using the atomic bomb will weigh more and more heavily as time goes on.

The belief prevails that the United States and allies will perhaps issue another ultimatum and will not use the bomb extensively until absolutely necessary to force the submission of the Japanese. In other words, the United States would rather be in the position of employing the weapon as a coercive measure rather than for actual destruction.

As a matter of fact, the bomb is so new and the test in this country was so recent that nobody knows just what damage the first one did in Japan. It is believed, for instance, that the Japanese themselves do not know what struck them and possibly all communication with the affected area and all persons within it have been destroyed. Hence the whole world is left to guess, along with the Japanese, as to what the power of the weapon really is though no one doubts that it can do damage beyond any one's imagination.

The problem for the Japanese military leaders has been simplified, however, by the atomic bomb. They have the choice of permitting the Japanese empire and many of her people to be killed for the honor of their country in a sort of suicide spirit or of surrendering and building the hope that some day the Japanese empire may be strong again and perhaps invent its own atomic bombs as a measure of self defense, if not offense.

Clearly the atomic bomb places upon mankind a greater responsibility than it has ever faced to find means to use reason instead of force to settle international disputes and to curb the greed and selfishness which feed the economic unrest out of which so often has come the urge to aggression.

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Atom Scientist Can't Stand Noise

Even Alarm Clock Jangles His Nerves, Dr. Dunning Says

By HERBERT KAMM,

World-Telegram Staff Writer.

There are no alarm clocks in the home of Dr. John Ray Dunning. The man who helped develop the most destructive weapon of all time, the atomic bomb, can't stand the noise they make.

So he invented a little gadget that automatically turns on the radio every morning, and he parts with slumber to the pleasant strains of breakfast music wafting into his bedroom.

But his penchant for things scientific didn't always produce the desired results, the 37-year-old Columbia University professor confessed today.

More often than not his childhood experiments in his home town of Shelby, Neb., backfired, like the time he hooked up a thingamajig to a power line and plunged the neighborhood into darkness by blowing out the fuses.

Built Radio Station.

"I wasn't discouraged, though," he said with a chuckle. "I built some of the first radio sets in town, and before I was out of high school I built a radio station and sold it."

"Still, when I entered Nebraska Wesleyan University," Dr. Dunning recalled, "I wasn't quite sure whether I wanted to be a lawyer, a minister or a scientist. Then I came to the conclusion that science was more fun. I found I usually could wave my hands over



Dr. John Ray Dunning.

World-Telegram Photo.

equipment, and it would work."

Dr. Dunning, whose experiments and research in atomic energy began more than a decade ago, has been associated with Columbia since 1929, when he joined the faculty as an assistant in physics.

As recently as 1936, when he was abroad on a traveling fellowship, the theory that atomic energy could be produced from neutrons, and harness the basic force of the universe for peace as well as war, was generally ridiculed.

Start of the Beginning.

"Now," he said, "we have started

Columbia Professor Sleepless for Days On Research Tasks

the beginning of a lot of things." Rigid censorship forbade him saying more than that about the atomic bomb, produced six years after he and a fellow scientist split the uranium atom for the first time in a subterranean laboratory at Columbia.

A man of boundless energy (he has gone for as much as a week with little sleep), Dr. Dunning devotes his spare hours at home to constant study and research. Science is both his avocation and vocation, his hobby and career.

He lives at 4501 Livingston Ave. in the Riverdale section of the Bronx, with his wife and two children, John Ray Jr., 7, and Ann, 2½. Ann still prefers dolls, but Junior already has begun to flirt with the mysteries of science. And his electric train never is on the blink.

Atom Bomb Staggered Men Who Conceived It

By the United Press.

LOS ALAMOS, N. Mex., Aug. 9.—Scientists who have worked for years to develop atomic power today were permitted to express their own opinions on the highly secret world-shaking discovery.

Statements by three men who helped perfect the Japan-smashing atomic bomb at Los Alamos were released by government public relations officials.

Said Dr. Enrique Fermi, Nobel prize winner:

"Atomic power may be used not only for purposes of destruction, but probably will prove also an important factor in progress. One might also say it is certainly the hope of scientists who contributed to this development that peacetime applications and wise use of this tremendously powerful weapon may ultimately serve to improve human relations."

Dr. Emilio Segre commented on the spectacular effect of the bomb's detonation:

"The first test of the atomic bomb staggered the imagination of even scientists who had a clear theoretical knowledge of energy. No man-made experiment had shown effects on such a scale. Only the great natural phenomena, like volcanic eruptions and the aurora borealis, are comparable to it."

From Dr. Bruno Rossi came this statement:

"My feeling, which is shared by most of the scientists who helped in the development of the atomic bomb and witnessed the first test, is one of awe for the tremendous source of power which has been put at the disposal of mankind."

"The thought of possible consequences of the discovery has more than a sobering effect on the satisfaction for the success of our work. What we all fervently hope is that the very destructiveness of

atomic energy will be a powerful factor in deterring people from future wars."

Defense Against Atom Bomb Futile

By J. BERNARD McDONNELL, Scripps-Howard Staff Writer.

WASHINGTON, Aug. 9.—Japan claims that they are devising defenses against the atomic bomb are scouted here. Our experts tried 5000 ways of forestalling its effects. All failed.

Officials say our facilities for producing atomic bombs are being extended so swiftly that we probably shall be making more bombs than we can use. Behind the three great government plants making atomic bombs are hundreds of smaller concerns doing their part.

Dr. Karl Herzfeld, physicist at Catholic University here, cited these facts concerning the atomic bomb:

The force of its explosion travels more than 7000 miles a second.

A piece of uranium 235 the size of a pin head would contain 50 million million million atoms.

When one of these atoms is split it generates 200 million atomic volts of energy.

Splitting a single atom need not cause wholesale destruction. Scientists for some time have been watching pieces of split atoms flying around behind glass.

The big bang comes when the explosion of one atom splits the next atom and it in turn explodes another and so on. The cumulative effect does the business.

Atom Bomb Called Unfortunate Precedent.

By Dr. Carlton Palmer.

No matter how great the havoc any nation may bring upon another through the use of atomic bombs in the future, it will be justified, for it need only point to our unfortunate precedent to support its mania of destruction.

We may come to regret our infernal example. The virtual absence of protests from the thousands of religious leaders shows how our diabolical propaganda of "bestial rats" and the "roast 'em alive" mania dulls our humanity. Yet even the bomber crewmen that dropped the missile were horrified by the unprecedented explosion.

"We are now prepared to obliterate every structure in Japan," boasted an official. This bomb was dropped in the heart of a city of 343,000 humans to wipe out military objectives and innocents alike. Yet this act is hailed by responsible leaders as the greatest achievement of the war.

Secretary Stimson assures us that every great industrial nation will develop this type of bomb. President Truman discloses that future attacks shortly may be intensified.

When the Nazi resorted to indiscriminate bombing of civilian areas we barely found words adequate to condemn their outrages, but when we obliterate 300,000 civilians in Dresden and blast a greater number in Hiroshima by improved Nazi methods we justify it in the boast of more efficient American destructiveness.

The nation to which the people of all the world have been accustomed to turn for humanitarian considerations may yet be despised for launching against another nation an invention, the destructive use of which may become the scourge of humanity.

Long Island City, N. Y.

World Conference To Outlaw Use of Atom Bomb Urged

Flame-Thrower Ban Also Demanded by The People's Lobby

By ROGER W. STUART, World-Telegram Staff Writer.

WASHINGTON, Aug. 9.—Demanding that atomic bombs and flame throwers be outlawed as weapons in future wars, the Peoples Lobby, Inc., today called for a new international conference to adopt such a ban as soon as the present war ends.

The lobby, whose president is retired Methodist Bishop Francis J. McConnell of New York, specifically has asked the four congressional delegates to the San Francisco conference—Sens. Tom Connally and Arthur H. Vandenberg and Reps. Sol Bloom and Charles A. Eaton—to request President Truman to call the proposed world meeting.

Not even an international police force should be permitted to use such weapons, the organization contends. The use of gas, germs and bombing of undefended areas also ought to be prohibited, it declared.

"As elected representatives of the United States at the San Francisco conference," the congressional delegates were told, "you have a keen appreciation of the necessity that the United Nations implement the high resolves there reached, since the atomic bomb has forcefully reminded us actions speak louder than words."

Benjamin C. Marsh, executive secretary of the lobby, said that his group holds that "science has a higher mission than to hasten global suicide."

The request to the four delegates observed that acceptance of decent standards for armed conflict and for international policing is fully as important as the necessity for economic stability.

"We therefore ask," the message said, "that you request the President, in addition to the undertaking he has given to seek measures which will make the splitting of the atom of social value, to call an international conference as soon as the Pacific war ends."

"Society," the organization concluded, "condemns the 'third degree' in domestic justice, and the practices we would outlaw are the 'third degree' in international relations. We should remember scientists of other nations may make the atomic bomb commercially practical before we do, and 'God's mercy' may not be as timely again."

Catholic Paper Scores Atomic Bomb's Use

By the United Press.

LONDON, Aug. 9.—The Catholic Herald, under the heading "Utterly Indefensible," today denounced the use of the atomic bomb.

"Throughout the war," it said "the Holy Father has persistently maintained a Christian distinction between legitimate and illegitimate weapons of war. This teaching has in practice been ignored by the belligerents."

"Now the process of inventing more and more terrible and more indiscriminate weapons regardless of morals, has reached its climax."

Truman Guides New Strategy

President Takes Personal Charge of Drive—Radio Speech Due Tomorrow at 10 P. M.

Washington, Aug. 8 (A. P.).—President Truman, taking personal direction of the drive which he believes will knock Japan out of the war, summoned Secretary of War Stimson today for a first-hand report on the atomic bombing of the enemy homeland.

When the next bomb will be released was a military secret known only to the White House and the High Command, but the Japanese continued to ignore the Potsdam ultimatum to surrender, and it was reported that the time was running short on another one of their cities fated to suffer the doom of Hiroshima.

One of the President's first acts on returning to his White House office today, after a month's absence at Potsdam, was to schedule a radio report to the nation for 10 o'clock, Eastern war time, tomorrow night. At the White House it was learned that the President would have something to say about the atomic bomb and its use against the Japanese.

Charles G. Ross, press secretary, said that he didn't know if the something was about the bomb would be a new surrender-or-die ultimatum to the Japanese, and he would not speculate about it.

Byrnes Joins Conference.

James F. Byrnes, Secretary of State, joined the Truman-Stimson conference soon after Joseph C. Grew, Under-Secretary of State, had personally brought some papers from the State Department to the White House. When Stimson left the executive of-

TRUMAN TAKES CHARGE OF BOMBING STRATEGY

Continued from Page 1.

...fices, he told reporters that he had given the President additional details on the effect of the atom bomb on Hiroshima. These he declined to discuss.

Mr. Truman worked on the speech today, as well as on a mass of other paper work which accumulated during his month-long absence. He held his calling list to a minimum, including brief conferences with Senators Hatch (D.-N. M.) and Kilgore (D.-W. Va.) and Secretary of War Stimson.

Associates of the President indicated that his report on the Potsdam conference probably will mention the new and revolutionary bomb used for the first time against Japan. These assistants said that they did not know, however, if the presidential address would go into any greater detail on the Pacific war, a phase ignored in the Big Three conference announcement because of Russia's neutrality. Mr. Truman scheduled a meeting with his Cabinet for Friday, and decided to withhold any news conferences until he has given his public report on the Big Three meeting.

The President brought back with him the official copy of the protocol signed with Britain and Russia to keep the peace of Europe. He also carried home with him agreements with the British for the final knockout blow against Japan.

Oppenheimer personally directed the first test of the atomic bomb at the Alamogoro Army Air Base in New Mexico. The War Dept. credited him with "achieving an implementation of atomic energy for military purposes."

In New York, Dr. Jacobson made a statement through his employers, Wilcox, Inc. He himself was said to be "too disturbed" to talk to the press.

Jacobson's statement read:

'Minor Post'

"The excitement caused by my article yesterday prompts me to make the following statement:

"It should be clearly understood that my connection with the Manhattan Project was in a minor official post.

"Naturally the material in this story represents my opinion rather than confidential information.

"I find that, as a result of later information eminent and qualified scientists connected with the project do not agree with some of my opinions.

"I am surprised and pleased to learn that the results of the July experiment in New Mexico indicate that only minor amounts of radioactivity are present after the explosion, and that these quickly disappear."

Scientist Says Bomb Left No Radioactivity

Dr. Oppenheimer Denies Story of Dangerous Aftermath

By United Press

WASHINGTON, Aug. 9.—Dr. J. R. Oppenheimer, director of the \$2,000,000,000 research project which produced the atomic bomb, says there was no reason to believe the bomb explosion over Hiroshima left any "appreciable radioactivity on the ground."

Dr. Oppenheimer's statement was issued by the War Dept. in denial of a newspaper story under the signature of Dr. Harold Jacobson, physicist, which said the atomic bomb would leave killing radioactivity in its wake for 70 years.

"Based on all of our experimental work and study, and on the results of the (July 16) test in New Mexico," Dr. Oppenheimer said, "there is every reason to believe that there was no appreciable radioactivity on the ground at Hiroshima and what little there was decayed very rapidly."

Pledged to Secrecy

Dr. Oppenheimer, Dr. Jacobson, and all other scientists connected with the atomic bomb project had been pledged to secrecy under the Espionage Act, the War Dept. told United Press.

As a result of the story published under Dr. Jacobson's signature, however, Dr. Oppenheimer was asked by the War Dept. to make a public statement of his views as to the accuracy of the Jacobson article.

Truman Confers With Key Advisers On Atomic Bomb

Peacetime Use Not Discussed; Parley Report at 10 Tonight

By the United Press.

WASHINGTON, Aug. 9.—President Truman today summoned his key policy makers to a White House conference with him and the men who perfected the atomic bomb.

The President's action was apparently hastily decided on. Called to the White House were Secretary of State James F. Byrnes, Secretary of War Henry L. Stimson and four of the men intimately connected with development of the atomic bomb: Dr. Vannevar Bush, director of the Office of Scientific Research and Development; Dr. James Conant, president of Harvard University; George L. Harrison, New York insurance executive, and Maj. Gen. Leslie Groves, executive director of the atomic bomb project.

Half-Hour Conference.

Mr. Harrison is alternate to Mr. Stimson as chairman of an interim committee appointed to make recommendations to the President for national and international control of the atom bomb after the war.

The President talked with the scientists and Cabinet members about 30 minutes. None of the men—all members of the interim committee—would say what was discussed. It appeared possible that Mr. Truman might have disclosed some of the things to be said in his broadcast tonight.

Truman Talk Tonight.

Mr. Stimson said later that the White House conference did not go into the peacetime uses of atomic power, with which the interim committee is concerned.

The President's radio report to the nation at 10 o'clock will reveal some of the background of Soviet Russia's agreement to join the Allies in the Pacific, Charles G. Ross, White House press secretary, said.

The 30-minute address over all networks also will supply additional details of the Big Three Berlin conference and will deal briefly with the atomic bomb. Mr. Ross said the speech would be about 3600 words long.

2d Atomic Hit



Associated Press Map, Aug. 9, 1945.

Another atomic bomb rocked Japan, this time at Nagasaki, indicated by arrow, following first historic atomic bombing of Hiroshima (underlined).

Bomb Stirs Mixed Feelings

General Opinion Seems to Turn With Horror Against Missile

TO THE EDITOR OF THE NEW YORK TIMES:

The destruction of Hiroshima by an atomic bomb fills me with horror. Sixty per cent of the city was destroyed and presumably 60 per cent of the population—men, women and children—were killed. There was no pretense of precision bombing for military purposes and the notice that the city was to be bombed contained no statement to anticipate such a hideous result as occurred. It is a stain upon our national life.

Neither Germany nor ourselves used poison gas, nor have the Japanese done so except in isolated instances, if then. Here was a device far more deadly and far more indiscriminate than poison gas and it has probably wiped out 60 per cent of the 300,000 people of that city. If the use of this terrible power can be confined to war personnel and war material, all right; but if it will result in the killing of 100,000 women and children, it is all wrong.

When the exhilaration of this wonderful discovery has passed we will think with shame of the first use to which it was put.

WM. CHURCH OSBORN.

Garrison, N. Y., Aug. 8, 1945.

Deteriorated Morals

TO THE EDITOR OF THE NEW YORK TIMES:

I am horrified at the indiscriminate, inhuman and un-Christian bombing of cities which we are committing. The latest achievement of "civilization," the atomic bomb, which the President has hailed as ushering in a new era, merely highlights what we have long been doing. With such a weapon there can be no question of precision bombing. It is simply mass murder, sheer terrorism on the greatest scale the world has yet seen.

A few years ago we were aghast when the Germans bombed Coventry indiscriminately. Either our moral indignation then was mere pretense, something to be cast aside once we were in a position to retaliate, or we have meanwhile sunk to the spiritual level of the Nazis. If there is any moral order in the universe, our disregard of human values will as surely make forfeit any claim of ours to moral hegemony as did the crimes of the Nazis and Fascists.

FRANCIS R. WALTON.

Wellesley, Mass., Aug. 8, 1945.

Tokyo Says Atom Bomb Seared Everything to Death

War Plants Leveled to Ground By Blast

By United Press

GUAM, Aug. 9.—Tokyo concedes that most of Hiroshima has been destroyed completely by the single American atomic bomb dropped Monday. It said blasted and blistered corpses "too numerous to count" littered the ruins.

"The impact of the bomb was so terrific that practically all living things, human and animal, were literally seared to death by the tremendous heat and pressure engendered by the blast," one Tokyo broadcast said.

American reconnaissance photographs confirmed that four and one-tenth square miles—60 per cent of the built-up area—of Hiroshima had vanished almost without trace in the world's greatest explosion.

May Be 100,000 Dead

Unofficial American sources estimated Japanese dead and wounded might exceed 100,000.

Five major war plants and scores of smaller factories, office buildings and dwellings were known to have been leveled. Only a few skeletons of concrete buildings remained in the obliterated area. Additional damage outside the totally-destroyed section still was being assessed.

Radio Tokyo, breaking its silence of more than 60 hours after the raid, said the "indescribable destructive power" of the bomb had crushed big buildings and small dwellings alike in an unparalleled holocaust.

Inhabitants were killed by blast, fire and crumbling buildings, Tokyo said. Most bodies were so badly battered that it was impossible to distinguish between the men and the women.

Prepare for Invasion

As Tokyo painted a fearful picture of the catastrophe, some sources saw a possibility that Japan might reconsider her rejection of the Allied demand for her surrender before she is invaded.

"It shouldn't take the Japanese long to think this over," one ranking officer said. "We plan to present them with bursting atoms as often as possible."

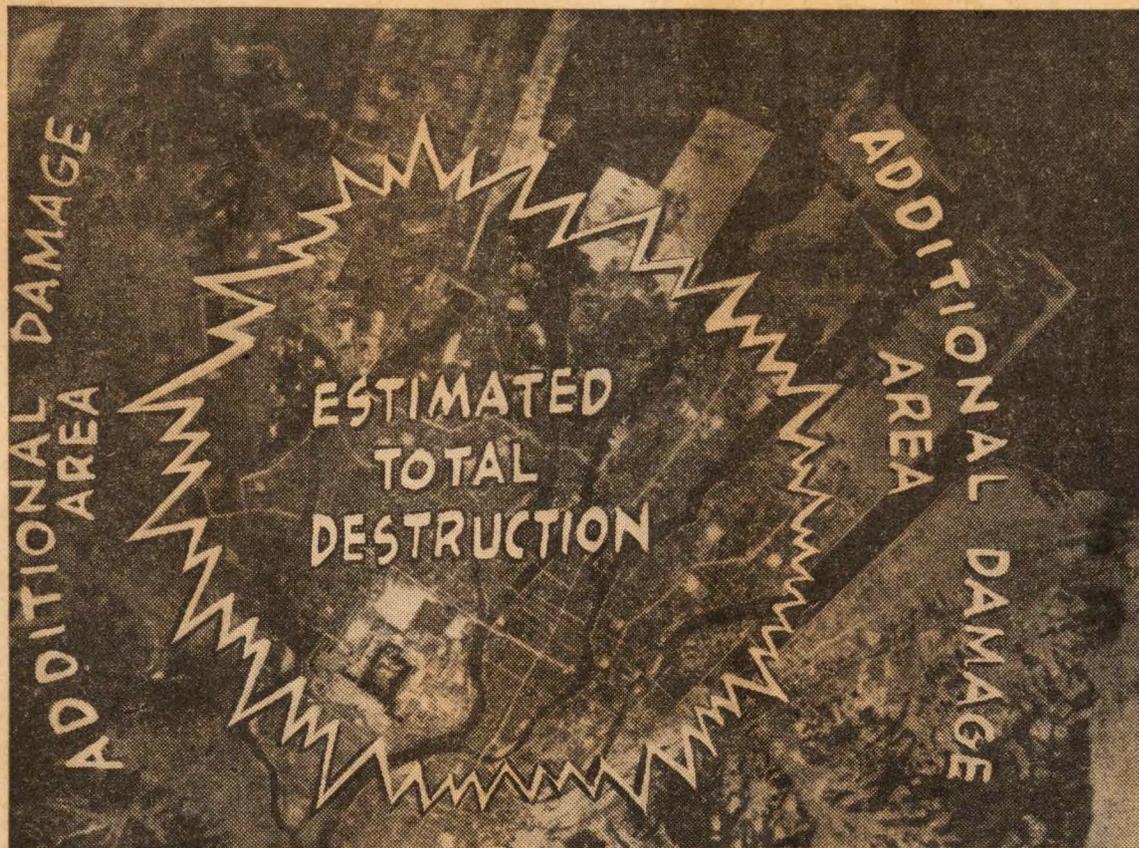
Preparations were continuous through the Pacific for an invasion of Japan if necessary, however. Everywhere transports were on the move with supplies and troops.

The Japanese charged over the Tokyo radio that the U. S. A. was violating Article 22 of the Hague Convention (to which Japan never subscribed) and showing disregard for humanity by attacking a non-military city with the atomic bomb.

Hiroshima actually was an important quartermaster depot and garrison city for the Japanese army.

Priority Liberation

Three assistants who had worked with Dr. Lise Meitner in research on the atomic bomb before she fled from Austria were liberated by American troops and shortly thereafter disappeared — apparently taken to the U. S. A. on the highest priorities—NBC reporter Grant Parr broadcast from Vienna.



This is Hiroshima. Within jagged circle is, at a rough estimate, the 60 per cent of built-up area wiped out.

USSR Not Telling How Much It Knows

By United Press

MOSCOW, Aug. 9.—The extent of Russia's knowledge of the atomic bomb remains a mystery today outside of government and scientific quarters.

It is a matter of military security whether Soviet scientists have been trying to produce an atomic bomb and it seems unlikely that there will be any disclosure here of the extent to which Russians were aware of American, British and German experiments.

From time to time Soviet newspapers have briefly mentioned the work of Russian scientists on splitting the atom. The well known physicist Abram Federovich Joffe in the Moscow News June 16 told how in 1930 he obtained a big appropriation from the late Serge Ordzhonikidze, then chairman of the Supreme Council for National Economy, to start work on the atomic nucleus.

There have been articles in newspapers regarding the cyclotron atom splitter.

News of the atomic bombing of Japan caused a great sensation here among Russians and foreigners alike. One aspect which at once appealed to Russians was the almost limitless range of wartime achievements in the realms of pure and applied science by the intimate collaboration of American and British scientists.

Russians were aware of some major achievements through Anglo-American cooperation but to the Russian at large—as to the American at large—President Truman's announcement that the first bomb had hit Japan was a tremendous surprise.

Russians were impressed also by the number of men and women working on the atomic bomb and by the enormous production scale.

Why Nazis Hoped

By United Press

OCCUPIED GERMANY, Aug. 9.—Germany's great wave of optimism last Winter, it was revealed today, was based on belief that rockets and buzz-bombs equipped

with atomic warheads would shortly be hurled against the Allies. The Germans, it was learned, believed that their atom-splitting experiments were far enough advanced to enable them to win the scientific race with the Allies and with it the war.

MIT Head Says Bomb May Cut War Deaths

By the Associated Press.

Manila, Aug. 9.—One of the world's great physicists, Dr. Karl T. Compton, president of Massachusetts Institute of Technology, described the atom bomb today as the most portentous scientific achievement in history.

Dr. Compton told correspondents at Gen. of Army MacArthur's headquarters he believed that despite the atom bomb's terrible potency it will have a tendency to "actually reduce the number of lives lost in the war—certainly for America and possibly also for Japan itself, if her rulers are sensible enough to realize what may be in store for them and act accordingly."

The grey-haired scientist is here with Dr. Donald Leet, professor

of geophysics at Harvard University and noted authority on earthquakes, to set up a Pacific branch of the Office of Scientific Research and Development.

Compton is director of the Pacific branch of OSRD, which is composed of civilian scientists who throughout the war have supplemented the research and development of the War and Navy Departments.

He and his associates played a leading part in the development of the atomic bomb.

"The brilliance was so great that it was blinding. We had been warned to look away. One man failed to heed the warning and he was blinded," said Dr. Leet, who witnessed the first test of the bomb in New Mexico from a distance of 50 miles.

Scientists Foiled Japs Seeking U.S. Atom Data

By the Associated Press.

BERKELEY, Calif., Aug. 9.—A year before Pearl Harbor Jap scientists attempted to obtain the latest American secrets on atomic power research, but were foiled by Nobel Prize Winner Dr. Ernest O. Lawrence and his band of brilliant young physicists.

The story was told today by University of California scientists.

A group of Nip physicists spent most of 1938 and part of 1939 at the laboratory, with numerous other foreign physicists. At that time they were shown every courtesy, given blueprints of the cyclotron and aided in construction of a cyclotron of their own at

the imperial University, Tokyo.

Their stay was marked by only one incident. Dr. Donald Cooksey, assistant director of the radiation laboratory, caught a snooping Jap. His actions caused him to be permanently barred from the laboratory.

However, when three eminent Jap physicists, Drs. Iimori, Yasaki and Watanabe, made a hurried trip to the U. S. in 1940, they were barred from the laboratory by a new rule promulgated for their benefit.

During their two days at Berkeley, the American scientists filled the Japs with a constant flow of accurate, but worthless information.



The Japanese city of Nagasaki as it appears in a mosaic of high-altitude aerial photographs taken recently in preparation, presumably, for today's attack.

Associated Press Wirephoto, from Army Air Forces.

U. S. Used Nazis' Bomb Spies

FBI Reveals That Five Agents Sent Over to America Double-crossed Germans.

Washington, Aug. 9 (A. P.).—The FBI said today that five German spies sent to the United States after 1939 to ascertain atomic bomb developments were persuaded to double-cross the Nazis and work as counter-espionage agents.

Several spies were intercepted in Europe and South America en route to this country and made double agents before they launched any espionage activities for the Nazis, an FBI spokesman said. He would not disclose their names.

As a result of American alertness, the FBI said, no sabotage of any kind was committed in an atomic plant. The German agents carried specific instructions from the German high command to get information on the atomic bomb experimental program, the spokesman said.

The Germans were especially interested in protective devices used in atomic experiments, in the sources of uranium, and whether any explosions had occurred in the atomic plants, indicating, the spokesman said, that the Germans were experiencing difficulties in their atomic bomb research. One spy, who worked for the FBI as a double agent two and a half years, transmitted fake information on our atomic bomb program to the Germans and, in return, received inquiries from Berlin which proved of value to the FBI.

Jap Scientists Foiled.

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crets on atomic power research, but were foiled by a Nobel prizewinner, Dr. Ernest O. Lawrence, and his band of brilliant young physicists. The story was told today by University of California scientists.

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Twenty Britons Help.

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Dr. Lawrence disclosed yesterday that since December, 1943, twenty British scientists under

Prof. H. S. W. Massey of the University of London have been working on atomic bomb research at Berkeley. Since the start of the war, the 4,900-ton cyclotron has been one of the country's

most closely guarded secrets. The radiation laboratory at Berkeley has been a research center, and not, as some had supposed, a link in the production chain of atomic bombs.

Disposal Suggested 8/10

TO THE EDITOR OF THE NEW YORK TIMES: Science has reached to the fringe of the universe and stolen the secret of life inviolate since the beginning of time.

Let us thank God the larceny was ours and not our enemies' and then dump the whole thing into the middle of the Atlantic or the Pacific, whichever is deeper.

Man is too frail a being to be entrusted with such power as atomic energy possesses.

WILLIAM H. FANNING.

Shoreham, Vt., Aug. 8, 1945.

Care Urged in Handling

TO THE EDITOR OF THE NEW YORK TIMES: The air is full of the news about the atomic bomb. Horrible as it may be to those who at present are getting the taste of the destruction, we must not forget that we can be boomeranged in just as hellish manner—not from the enemies, but through mistakes in handling the weapon, because of many unforeseen, uncalculated reasons. It may strike us back just as we strike. I hope it does not. But, I feel, there's always the danger of our getting an "afterglow" of this terrible agent.

JULIUS ZIRINSKY.

New York, Aug. 9, 1945.

WT 8/9

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Bomb Jitters Are Unjustified

World Held Quite Safe Until Far More Than Small Atom Split Is Attained.

By HOWARD W. BLAKESLEE,
Associated Press Science Editor.

The public jitters now spreading concerning the perils of the atomic bomb are not justified, either by the official facts from Washington or by the scientific records of the discovery.

It is a scientific fact that the energy in the complete explosion of one pound of uranium could blow the Empire State Building twenty miles into the air.

It is possible, as unofficially reported, that eleven pounds of uranium are used in the present atomic bomb. But it also appears certain, from the scientific records up to the time of the blackout, from the actual reported performances of the bomb and from Washington's official descriptions, that not all the uranium explodes. Scientists started with an explosion which released less than 1 per cent of uranium's explosive power. It is unlikely that they have done much, if anything, to increase that percentage. They would not need to increase the percentage to show the effects reported from Japan.

Uranium atoms split in two to produce the atomic explosive power. Splitting in two is entirely different than having the whole atom explode. The world is quite safe until far more than a single split can be attained. The entire atom would have to come apart to make the twenty-mile blow-up of the Empire State Building with a pound.

Other Atoms Not Yet Split.

Any of the other ninety-one different kinds of atoms, such as gold, iron, lead, iodine or carbon, could cause a comparable destruction, per pound, if they could be made to blow up completely. But on the evidence to date scientists have been unable to get a single one of the other atoms even to split, much less blow up completely. By the scientific records, uranium is the

one atom likely even to split. It is the biggest one of all, and it is unstable. As the atoms get smaller they seem more stable, are harder to damage and give off only chips and rays when strong rays hit them.

Progress will be made both with uranium and other atoms, both for self-protection of America and for the dreams of atomic power. But the progress along those lines is expected to take many years. Even the progress that brings man the millennium of atomic power does not mean anywhere near enough explosive energy to destroy the world.

Radioactivity Doubted.

Another public worry is that atomic bomb explosions make the face of the earth radioactive, like live radium, so that people who stay around a bombed area will die slowly of X-ray burns, or more quickly of neutron burns, which are highly lethal. It is a fact that a huge explosion of energy creates a little bit of this artificial radium. But that is nothing to worry about. Every person is constantly under the fire of radium rays. It comes naturally from the earth, the air, and particularly from the walls of great buildings.

A Geiger counter, the instrument that clicks each time a radium ray hits it, will chatter nearly all the time almost anywhere. But those rays do no harm.

Prospects are most unlikely that an atomic bomb will cause any dangerous increase in rays. These artificially caused rays, moreover, do not last long, most of them stopping after a few hours or a few days.

Man, it was said today, has learned how to destroy the atmosphere. The reason for this being, again, the fear of making the air radioactive. The answer is, first that the air already is somewhat radioactive, made so by radon gases, and second, radioactive air is not destroyed. You couldn't tell the difference between it and ordinary air, without a Geiger counter.

Fear of Unknown.

Today's jitters come not from actual facts but from the unknown. It is not unknown that atomic explosions can destroy everything, even the greatest stars. But how to make such an

explosion is just as unknown today as ever.

Oak Ridge, Tenn., Aug. 9 (A. P.).—There is absolutely no danger of an atomic explosion at Clinton Engineer Works, Col. Kenneth D. Nichols, commanding officer, said today.

"Although these plants are the main units for production of atomic bombs, adequate safeguards make an atomic explosion impossible," he said.

He declared workers are exposed to no more than usual industrial hazards and that thus far safety records are better than average for Army engineering construction.

"Many industries have greater hazards than C. E. W. does, and few have taken as elaborate precautions," he said.

ATOMIC-BOMB SHUDDERS

The world received the news of the atomic bomb with elation, but an elation tempered with awe and doubt. President Truman, Prime Minister Attlee, Secretary Stimson and others in high positions have already promised that the secret of the bomb will be well guarded and revealed only to governments that can be trusted. At once questions arise. Can the secret be kept? What governments can be trusted?

In the past no nation has succeeded in keeping a military secret. In the Franco-Prussian war the French hushed up the mitrailleuse. When the Whitehead torpedo was first introduced another unsuccessful attempt at secrecy was made. Hitler tried to keep the rocket bomb a secret—in vain. The very nature of science makes secrecy impossible. We may never be told how uranium is bombarded with neutrons in a bomb at exactly the right time and under the right conditions, but we may be sure that all military powers will recruit enough scientists to develop their own atomic bombs, just as they developed their own high explosives. The fundamental principles whereby at least part of the uranium atom is destroyed by bombardment, with a sudden release of an enormous amount of energy, have been common scientific property for six years. It follows that the application of the principles is pure technology and within the compass of hundreds of well-trained physicists and engineers.

Yet an international conference of the kind proposed by Secretary Stimson ought to be held. Much good may come from it. If conferees shudder enough at the prospect of another war in which rocket-propelled atomic bombs will be directed at hapless cities across whole continents and oceans they ought also to shudder at high explosives, sixteen-inch naval guns, land mines, torpedoes, and the rest of war's horrible parapher-

nal. In a word, the trail may be blazed for disarmament and peace. Whether or not anything will come of this shuddering remains to be seen. The House of Commons shuddered when Kitchener mowed down the hordes of the Mad Mullah in the Sudan during a battle in which the machine gun was first used, and some members even proposed that the weapon be outlawed. But the machine gun is still used. In the fifteenth century Leonardo and Tartaglia shuddered at the thought of what their own military inventions would do—to no avail. If this time the shuddering produces more tangible results, the invention of the atomic bomb was worth the two billions that it cost.

In Praise of Science

TO THE EDITOR OF THE NEW YORK TIMES:
The sensational news of the past few days about the catastrophic effects of the new atomic bomb should prompt us to pause and reflect. Perhaps the modern scientists have found a means of ending all wars, after centuries of futile efforts by statesmen, pacifists and economic groups.

Now that it has been made reasonably certain that all of Manhattan Island could be wiped out by a few of these bombs, war is no longer in the realm of bloody man-to-man fighting. Realizing the imminence of terrible disaster without a moment's notice nations of the world will hesitate in their dreams of aggrandizement and conquest.

Modern science has won this war for us. Modern science is winning the peace for us. And modern science will provide a means of living and a security of living for the generations to come which this world has never dreamed of.

WALTER NIEBUHR.

New York, Aug. 9, 1945.

CATHOLIC NEWSPAPER ASSAILS ATOMIC BOMB

LONDON, Aug. 9 (A. P.)—The Catholic Herald today criticized the atomic bombing of Japanese cities. The religious newspaper, in a front-page editorial, said use of the bomb "is not only utterly and absolutely indefensible in itself but the reaching of this appalling goal lights up for us all the immorality along the path we have all been treading."

Asserting that Pope Pius XII throughout the war had "persistently maintained a Christian distinction between legitimate and illegitimate weapons of war," The Herald said "it would have been better for all of us if we had courageously stood by him."

H. Stanley Jevons, a retired college professor, sent a telegram to President Truman and Prime Minister Attlee on behalf of the Bombing Restriction Committee, asserting that "the indiscriminate massacre of civilians by whatever means creates appalling precedents for the future."

LONDON, Aug. 9 (Reuter)—The Archbishop of Canterbury, the Right Rev. Geoffrey F. Fisher, today expressed his fear that the real danger of the atomic bomb lay not in endless destruction but in the increased leisure it offered mankind.

WASHINGTON, Aug. 9 (U. P.)—Benjamin C. Marsh, executive secretary of People's Lobby, Inc., today called on the United Nations to outlaw the use of atomic bombs as well as poison gas, disease germs, flame throwers and bombing of undefended areas.

WASHINGTON, Aug. 9 (A. P.)—Sir James Chadwick, British scientist, said today that some of his colleagues refused to help work on an atomic bomb for fear they might be creating a planet-destroying monster.

TEST BOMB CREATED HALF-MILE CRATER

By Wireless to THE NEW YORK TIMES.
MANILA, Friday, Aug. 10—A solemn warning to Japan came today from Dr. Karl T. Compton, president and director of the Pacific branch of the Office of Scientific Research and Development. "There is no question," he said, "that this is the most portentous scientific achievement in history. It should have tremendous influence in shortening the Japanese war and in spite of its terrible potency in actually reducing the number of lives lost in the war—certainly for America and possibly also for Japan herself if her rulers are sensible enough to realize what may be in store for them and act accordingly."

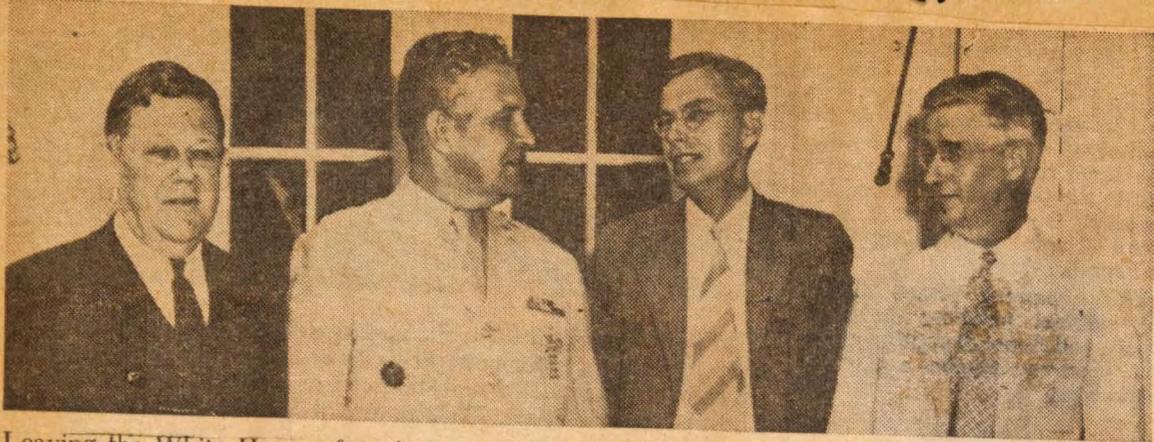
The terrific effects of the atomic bomb were described at a press conference here today by Dr. Donald Leet, Professor of Geophysics at Harvard, who witnessed the test on July 16 in the New Mexico desert.

"It beggars description," he said. "I was fifty miles from the explosion awaiting a message. There were thunderstorms on the horizon and I was afraid that I would not see the flash."

"When it let go, it lit up 180 degrees of the horizon, not like one but a dozen brilliant suns. It stayed lit up and made chills run up my back because I knew what might happen if it was not controlled."

"It was followed by a brilliant red wall of flame. Fifty miles away it was like an earthquake. At the source the brilliance was so great that an individual looking at it would be blinded. One observer did so and was blinded."

"It created a crater half a mile across and a quarter of a mile long. The seismic disturbance caused does not equal that of an earthquake but the force is so concentrated that I would rather go through an earthquake than face that explosion."



Leaving the White House after their meeting with President Truman yesterday are these four men closely linked with the success of the atomic bomb: Left to right, George L. Harrison, special consultant to Secretary Stimson; Maj. Gen. Leslie Groves, Dr. James B. Conant, President of Harvard, and Dr. Vannevar Bush, who directed basic research on the bomb.

FRIDAY, AUGUST 10,

Congress Split On Policy for Atomic Patents

Shall Government Or Private Interests Hold Rights for Use?

By NATHAN ROBERTSON
Washington Bureau

WASHINGTON, Aug. 10.—The success of Government research in developing the atomic bomb has spotlighted one of the most urgent problems awaiting action while Congress vacations — authorization of a postwar Governmental research program.

The atomic bomb is the most sensational of the Government's wartime scientific achievements, but it is only one of many. Thousands of others have resulted from the unprecedented concentration of research under Government direction and financing. Scientific progress has been advanced by many years.

These results have been achieved by Government financing of a huge research program which has cost about \$700,000,000 a year in addition to the \$2,000,000,000 spent developing and producing the atomic bomb.

The Issue

The issue facing Congress is whether the Government should let this huge research program go to pieces after the war, or should make arrangements to continue it so this country can keep ahead, not only in research that affects national defense, but also in peacetime science.

Strong recommendations for the creation of an agency to continue a broad Governmental research program after the war have come from the Kilgore subcommittee of the Senate Committee on War Mobilization, and from a Presidential committee headed by Vannevar Bush, head of the Office of Scientific Research and Development.

Their recommendations are generally along the same line, although here are a few sharp conflicts.

Conflict

Bills embodying both plans have been introduced. The Senate committee's plan is the basis for a bill by Sens. Harley M. Kilgore (D., W. Va.); Edwin Johnson (D., Colo.), and Claude Pepper (D., Fla.). Sen. Warren Magnuson (D., Wash.) has introduced a bill based on the Bush recommendations.

The major conflict between the Kilgore and the Bush-Magnuson approaches to the problem of postwar research lies in the handling of patents resulting from government research. Kilgore wants them

to go to the Government for the benefit of the public. The Bush plan would permit patents to be owned by the private research institution that developed them at the Government's expense, reserving for the Government only the right to use them on a royalty-free basis.

The Bush plan is the one that has been followed in many of the wartime research projects financed by the Government. As a result, some of the most important wartime inventions will be locked up by private patents after the war instead of being open to the public.

BOMB PICTURES DELAYED

NYT 8/10
Army Flying Hiroshima Films
for Scientists to Study

Special to THE NEW YORK TIMES.

WASHINGTON, Aug. 9 — Photographs of the damage inflicted on Hiroshima by the atomic bomb are being flown back to the United States and will be examined by scientists who participated in the discovery of the bomb before they are released for publication, a War Department spokesman said today.

Explaining why the pictures had not been transmitted by radio, the Strategic Air Forces said that it had been found that high-altitude post-attack reconnaissance photographs did not reproduce well by radio and that this was particularly true in this case, where the conditions under which the photographs were taken differed from those generally prevailing. There also are scientific aspects that those who worked to perfect the bomb want to study before the pictures are released for general distribution. It is considered important that the original negatives be available for this study.

BOMB SECRET WELL KEPT

Companies Did Not Know They
Were Working on Atom Project

The United States Rubber Company supplied large quantities of materials used in the production of the atomic bomb, company officials announced yesterday. They said most of this work on the secret project was done between July and October, 1944. The York Corporation, manufacturers of air-conditioning and refrigeration products, also disclosed yesterday that in President Truman's announcement they had learned for the first time of the importance of their "extensive and secret labors."

A small plastics company, Design Center, Inc., of 351 West Fifty-second Street, did some important work on the bomb, but had no idea what it was for, according to Louis H. Pfohl, president.

The United Service Organization contributed indirectly by providing recreational facilities for plant workers in the two main construction camps in Washington and Tennessee. Mrs. Pearl Case Blough, director of USO services in war production communities, announced yesterday.

TENNESSEE AND THE ATOM

NYT 8/10
Clinton, on the Clinch River, a little less than twenty miles from Knoxville, Tenn., was settled about 1787, was named Burrville until Aaron Burr fell into disgrace after his fatal duel with Hamilton, and at the beginning of the present war had a population of about 3,000. It was in a coal-and-iron region, but not too prosperous. In the hills to the north and west people were still living under fairly primitive conditions, although TVA's big construction jobs and TVA's partially completed program of rural electrification had changed the situation for the better. They were good people, many of them of the Scotch-Irish stock which had come down the Clinch and Powell toward the end of the eighteenth century. When they could get education they took to it like ducks to water. They made good workmen on TVA projects and on the mysterious project at nearby Oak Ridge, for which many of them were recruited.

But until these developments they had lived, through no fault of their own, in a back eddy of American life. Some of them had one-mule farms and planted in the dark of the moon. Until they got electricity their life was not so very much different from that of their ancestors of a century ago. If they went down to work in the mining towns they still did not get far away from the back country. Now they find themselves, not in the eighteenth century or the nineteenth, or, as most of us have to think of it, even in the twentieth. They have been jumped into close proximity with the twenty-first century—the age of atomic power. Maybe there is a "dog-trot" cabin in the hills above Oak Ridge where a farmer sits with his squirrel rifle by his side, a hound dog at his feet, a steep plot planted to corn and potatoes in front of him, and gazes down into the most stupendous concentration of material energy the world has ever seen. He might wonder if he were awake. We all do.

Nagasaki Atom Bomb Leaves 4-Mile Smoke Cloud

PM 8/10

Fires Seen Three Hours After Attack

By RICHARD A. YAFFE

Nagasaki, the second Japanese city hit by an American atom bomb, was covered by a pall of smoke 20,000 feet high three hours after the explosion, it was revealed at Guam today.

Photographs taken after the raid on Nagasaki, sprawling city of 252,000, shipping center and naval base on the northwest tip of the home island of Kyushu, showed scattered fires outside the smoke area. Gen. Carl Spaatz, chief of the U. S. Strategic Air Forces in the Pacific, announced.

Spaatz said that no further details of the bombing were available now, but he declared earlier that the results of the atomic raid on Nagasaki were "good."

The Japanese radio, meanwhile was busy informing anyone who wanted to listen that Japan, too, "may use weapons like the atomic bomb." However, unlike the Americans, Japanese would use them only against military personnel, they said. They did not say where they would get them.

'Warning'

Radio Tokyo announced that the atomic bomb would not lead to the end of the war and warned that "if one power succeeds in putting it to use, the rest will catch up with it."

"No arms or weapons, when they are capable of mass slaughter of humanity, are to be allowed to be used as actual weapons against man," Tokyo said.

The Singapore radio (Japanese) said the atomic bomb wasn't such a novel thing, and that the Americans must have drawn "on the result of the Japanese researches."

The raid on Nagasaki yesterday followed the first atomic bomb attack on Hiroshima Sunday night. It followed along the same pattern and if it accomplished the same results, it leveled an area of four and a tenth square miles.

Members of the Superfortress crew that dropped the atomic power on Nagasaki reported good results, but they did not go into details except to say that the bomb exploded with a blinding flash that was visible for miles, and with a terrific roar.

In London, Lord Louis Mount-

batten, British commander in chief in Southeast Asia, said he thought the atomic bomb was a good thing, but that he was going ahead with his plans as though it didn't exist. It would be the greatest folly, he said, "if I should work on the assumption that the atomic bomb will stop the war."

Asked by an Indian pacifist if he didn't think the use of the atomic bomb was "inhuman," Mountbatten said:

"If the bomb kills Japanese and saves casualties on our side, naturally I am not going to favor the killing of our people unnecessarily."

1945

PM 8/10

Atomic Study Lesson in Co-operation—Mrs. FDR

Says Pooling Of Many Minds Sets Pattern for Future

Dr. Lise Meitner, the woman scientist whose research aided in the development of the atomic bomb, last night urged co-operation among nations for its future control in the best interests of humanity.

Dr. Meitner spoke over the NBC Network with Mrs. Eleanor Roosevelt, widow of the late President, who was in the NBC newsroom here. Dr. Meitner spoke from her home in Leksand, Sweden, the country to which she fled after being exiled from Germany because of her Jewish origin.

Following her NBC broadcast, Mrs. Roosevelt spoke over the Swedish Network in a special broadcast. Mrs. Roosevelt said that the late President had told her of the atom research being carried on, but never had revealed to her the secret of the atomic bomb.

In the conversation between Mrs. Roosevelt and Dr. Meitner, Mrs. Roosevelt asked Dr. Meitner what her feeling was when she first heard of the dropping of the bomb and realized that it might bring this destructive war to a close.

'For Peaceful Work'

"Women have a great responsibility and they are obliged to try, so far as they can, to prevent another war," Dr. Meitner said. "I hope that the construction of the atom bomb not only will help to finish this awful war but that we will be able too, to use this great energy that has been released for peaceful work."

"I hope that by the co-operation of several nations it will be possible to do so, to come to better relations between all the nations and to prevent such horrible things as we have had to go through in the last few years."

Mrs. Roosevelt said that "one thing we must all remember is that this discovery was made by the pooling of many minds belonging to different races and different religions, that the way the work was done sets the pattern for the way in which in the future we may be able to work out our difficulties—not by setting up superior races, but by learning to co-operate and using the best that each one has to contribute to solve the problems of this new age."

Symbol to Women

"I congratulate you on what you have done," she continued, "and I hope that a way will be found whereby, just as Mme. Curie was a symbol to women after her great discovery, you may be a symbol to the women of the future and inspire them to insist on playing the best possible part in wiping out all discrimination and intolerance. As long as they exist, we cannot get the best for mankind."

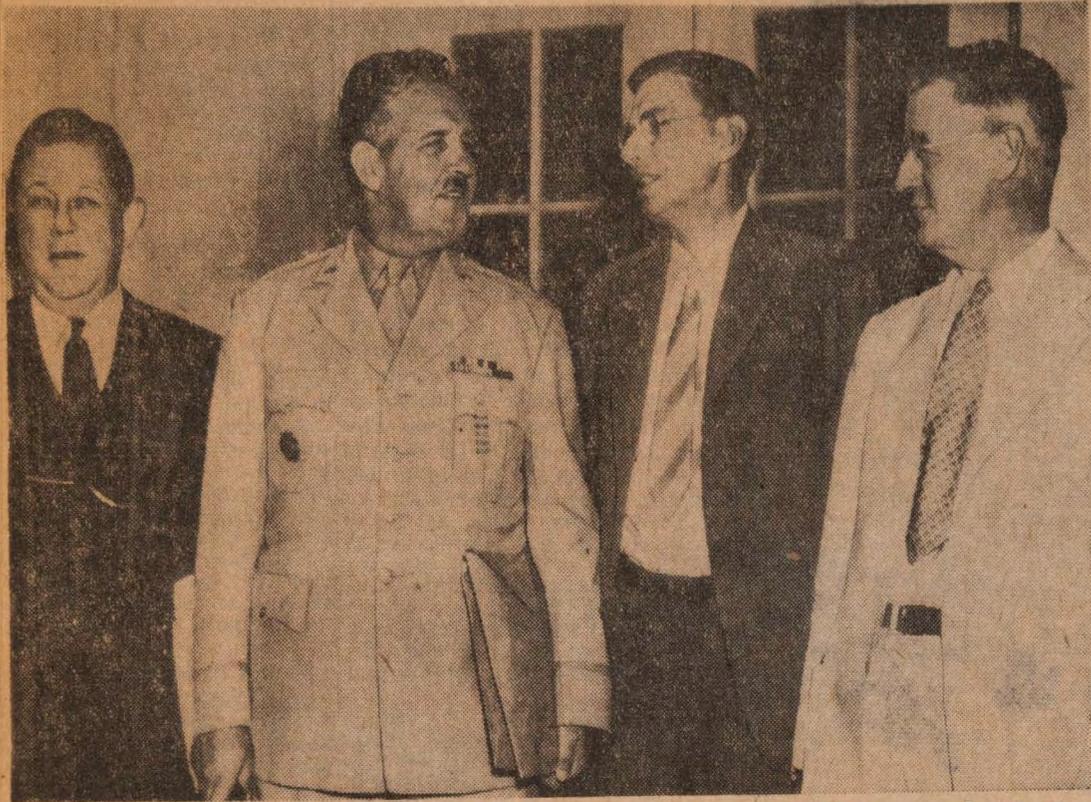
Mrs. Roosevelt in her interview by Sven Norberg, an NBC correspondent in Sweden said:

"I hope that it will be used for constructive purposes after the war. I think it should be controlled very carefully, internationally."



Mrs. Roosevelt

ATOMIC BOMB ADVISERS AT THE WHITE HOUSE



George L. Harrison, Maj. Gen. Leslie R. Groves, Dr. James B. Conant and Dr. Vannevar Bush leaving a conference with President Truman.

Associated Press Wirephoto

Truman, Chief Aides Study Effect Of Atom Bomb at Special Parley

WASHINGTON, Aug. 9 (AP)—President Truman called in top military, diplomatic and scientific advisers today to discuss the atomic bomb, whose terrific destructive effect twice has been felt by Japan.

Secretary of War Henry L. Stimson canceled a regular Thursday morning news conference to attend the White House meeting. He took with him Maj. Gen. Leslie Groves, who supervised the secret work and harnessed for war purposes the atom's terrific energy. General Groves was to have attended Mr. Stimson's news conference today.

Secretary of State James F. Byrnes, who sat beside Mr. Truman when the President announced Russia's declaration of war on Japan yesterday, came across the street to join the meeting.

Others present included scientists who played a leading part in developing the revolutionary weapon:

Dr. Vannevar Bush, director of the Office of Scientific Research and Development, and Dr. James Conant, president of Harvard University.

George L. Harrison, one-time president of the New York Federal Reserve Bank, who also contributed to the vast engineering work involved, completed the group.

Upon leaving the White House, the conferees declined to discuss their session with the President.

Nobel Winner Aided Work

WASHINGTON, Aug. 9 (UP)—The President talked with the scientists and Cabinet members for about thirty minutes. Mr. Stimson said later that the conference did not go into the peacetime uses of atomic power, with which the interim committee is concerned. All

he would say was that Mr. Truman sent out "a special call" for the members to visit him.

Meanwhile, the War Department disclosed that Dr. Harold C. Urey, 1934 Nobel Prize winner in chemistry, was one of the scientists who played an important part in development of the atomic bomb. Dr. Urey of Leonia, N. J., has been executive officer in the Columbia University Department of Chemistry since 1939. He specialized in studying the structure of atoms and discovered the hydrogen atom of atomic weight which combines with oxygen to produce so-called "heavy water," a substance used in atom-splitting experiments.

General Groves also disclosed the names of a number of the other officers whose work was of "particular value" to the development of the bomb. They included Col. Earl H. Marsden and Maj. John E. Vance, both of New Haven, Conn.; Lieut. Col. William A. Consonidine of Newark, N. J.; Maj. Robert R. Furman of Trenton, N. J.; Lieut. Col. Charles Vanden Bulck of Lincoln Park, N. J., and Lieut. Joseph Volpe of Cedar Grove, N. J.

Also Chief Warrant Officer Murray S. Levine of Brooklyn, N. Y.; Maj. Edgar J. Murphy, Lieut. Col. Arthur V. Peterson and Maj. Francis J. Smith, all of New York; Maj. Joseph F. Sally of Malverne, N. Y.; Lieut. Col. William P. Cornelius of Ennis, Tex.; Lieut. Col. Paul L. Guarin of Houston, Tex., and Lieut. Col. W. B. Parsons of Seattle, Wash.

The War Department said Col. Stafford L. Warren of Rochester, N. Y., was chief of medical services for the project, adding that he earned much of the credit for the "remarkable safety records" of the plants manufacturing the new weapon.

an day, only waiting for the dash! Continued

Dave Boone Says:

My hunch is that the Japs were found to be working like blazes to perfect an atom bomb and were so close to the secret that Uncle Sam was forced to the decision to use his bomb first. I don't think our leaders would have made the choice otherwise.

The Germans were close to it, and it seems reasonable to assume that the Japs were not in complete ignorance of the bomb and its possibilities.

Bomb Razed a Third of Nagaaki; Japan Protests to U. S. on Missile

NYT

By The United Press.

8/11

GUAM, Saturday, Aug. 11—The second and perhaps the final atomic bomb explosion of the Pacific war demolished 30 per cent of Nagasaki, Japan's eleventh city, Thursday, leveling almost the entire industrial area in a mighty blast visible 250 miles, it was announced today.

It was an explosion as terrible destructive as the first atomic bomb blast, which leveled 4.1 square miles of Hiroshima on Monday, wiping out 60 per cent of that city.

[The Japanese Government was reported by the Domei agency to have filed a protest with the United States Government Friday "against its attack on Hiroshima with an atomic bomb" and to have sent a message through the Swiss Government, protesting power for

along twelve miles on both sides of the land-locked Nagasaki Bay, was in ruins. An area of .98 square miles of the built-up area of 3.3 square miles was devastated.

According to General Spaatz' report, destruction within Nagasaki stretched along both sides of the Yurikami River, where most of the city's heavy industries are situated.

For two miles from north to South and seventh of a mile from east to west destruction spread across the heart of the city. A district east and south of the point where the Yurikami River opens into Nagasaki Harbor also was demolished, it was announced.

Included in the stricken area of Japan's eleventh largest city were the Mitsubishi steel and arms works, the Mitsubishi-Yurikami ordnance plant and other heavy industries turning out tools of war for the Japanese.

Reconnaissance photographs were taken after a heavy pall of smoke had cleared from the city. The first photos, taken three and a half hours after the terrible explosion, had shown the city obliterated by smoke towering 20,000 feet.

Nagasaki, on Kyushu Island's western coast 200 miles southwest of Hiroshima, was an important embarkation point and a major shipbuilding and repair center. It received huge quantities of raw materials from the shipping lanes to Japan from Asiatic mainland ports.

Blast Seen 250 Miles Away

GUAM, Saturday, Aug. 11 (P)—Nagasaki, second city bombed by atomic fission, was crushed by a fiery explosion "too tremendous to believe," American eyewitnesses reported yesterday.

Acknowledging for the first time the atomic bombing of Nagasaki, Domei claimed today that "damages were extremely light, although investigators are presently proceeding in connection with details."

The dispatch was transmitted nearly forty-eight hours after the Nagasaki attack.

[Without identifying the bomb as atomic, the dispatch said that "one large-type enemy plane" had dropped a "seemingly new-type bomb."]

The terrible explosion at Nagasaki, hit Thursday, was seen by Okinawa-based fliers who were on missions seventy-five to 250 miles from the doomed city of 253,000.

An immense fiery ball shot into the air 8,000 feet, they reported, followed by a column of billowing smoke which rose quickly to 20,000 feet. "It covered an area of the sky at least twenty miles square," Lieut. Otto H. Schumacher of Wallhalla, S. C., said.

[Nagasaki was still a mass of angry flames twelve hours after the bombing, a Newsweek correspondent, Robert Shaplen, reported via the National Broadcasting Company after having flown to within ten miles of the Kyushu port city on an American patrol plane. "It was like looking over the rim of a vol-

canese interest, "requesting it immediately to discontinue the use of such an inhuman weapon."

[The dispatch, recorded by the Federal Communications Commission, said that news of the request was "officially revealed" in Tokyo.

[The Japanese Government also asked the Swiss Minister to explain the "objectives of the Japanese Government's protest" to the International Red Cross.]

Reporting the preliminary estimate of damage in Nagasaki, based on aerial reconnaissance yesterday, Gen. Carl A. Spaatz, chief of the Strategic Air Forces, announced the effects of what might be the last atomic bomb assault of the war.

The city's industrial area, spread

Atom Bomb Is Lawful, Jurists Decide at Rio

By Wirelens to THE NEW YORK TIMES.

RIO DE JANEIRO, Aug. 10—The flying bomb is an unlawful weapon, but the atomic bomb is lawful, according to the Inter-American Juridical Committee meeting here. The committee reached its decision after hearing an address by Prof. Charles Fenwick, American delegate.

Professor Fenwick stressed that the flying bomb's blast could not be directed to any given point, but the atomic bomb could be guided so as not to hit undefended areas.

RIO DE JANEIRO, Aug. 10 (P)—The Inter-American Juridical Committee held today that the head of a State waging a war of aggression was criminally liable and subject to the judgment of an international tribunal.

Fundamentally, the report, signed by the delegates of Brazil, Mexico, Chile, Argentina and the United States, would make Emperor Hirohito of Japan subject to the tribunal since it listed Ministers of State separately from the head of a State and his necessary collaborators.

cano in the process of eruption," he said.]

Gen. Carl A. Spaatz announced at Army Strategic Air Forces headquarters that results of the Nagasaki bombing were "good," but that smoke obscured the area from a photographic plane three and a half hours after the attack.

Japanese Depicts Horror

SAN FRANCISCO, Aug. 10 (P)—Havoc caused by the atomic bomb explosion on Hiroshima was "the most awesome sight" he ever saw, a Japanese soldier said today in a broadcast from Tokyo recorded by the American Broadcasting Company.

The "eyewitness," Tokyo said, was a "certain army corporal attached to the staff headquarters of the Central Army District."

The corporal was in a Hiroshima hotel the day of the blast and stuck his head out the window when he heard Superfortresses overhead, he said.

"I looked up," he continued. "Simultaneously a lightning-like flash covered the whole sky, blinding my eyes. Unconsciously, I dived for cover and a torn quilt miraculously was blown over me, which I hugged to myself for dear life."

"Several minutes later I was outside. All around I found dead and wounded. Some were bloated and scorched—such an awesome sight—their legs and bodies stripped of clothes and burned with a huge blister.

"All green vegetation, from grasses to trees, perished in that period. It was the most awesome sight I have ever witnessed."

ORK TIMES, SUNDAY, AU

Topics of The Times

NYT

Doubts
Will
Persist

The mathematician is the lucky one. To give you an idea of the future atomic engine he scribbles a few figures and signs on

the corner of his newspaper, and you have the whole story, complete, precise, unanswerable. But we, poor laymen, trying to define this new miracle in ordinary words and pictures, only end up by raising more questions than we can answer.

Automobile engines of the future may be the size of a man's fist. Yes, but will the human fist be strong enough to hold the steering wheel on that automobile?

A cup of atomic fuel may carry a ship the size of the Queen Mary across the Atlantic. Yes, but who will want to spend two hours crossing the Atlantic by ship when he can do it by rocket in three minutes?

An atomic fuel supply the size of a brick may carry a plane several times around the globe. Yes, but will there be a terrestrial globe to fly around?

One
Man
Knew

Apologies are due Mr. Churchill's opponent in the former Prime Minister's own constituency in the recent election. Among those

to express regrets should be Mr. Churchill himself. He has said about the new atomic revelations that we must all pray that these "awful agencies" may be made to conduce to world peace and prosperity.

Now it will be recalled that Mr. Churchill's opponent in the election was a virtual unknown whom the dispatches came very near to calling a crackpot. The principal plank in his platform was a universal working day of just one hour.

He
Laughs
Last

Half a century ago there were economists who believed a four-hour working day enough to supply everybody with the basic

needs and comforts. A dozen years ago the more ardent spirits among the Technocrats argued for a working day of forty minutes. Their calculations were based on the development of Giant Power, by which they mean the skillful utilization of existing energy sources. They did not convince everybody.

But today with the infinite potencies of atomic energy there cannot be the least question that Mr. Churchill's opponent for the House of Commons was right. The amiable crackpot now sees the world's mobilized scientists cracking away at the atom and permits himself to crack a smile. It was what he had in mind all the time, no doubt.

Danger
On the
Inside

But it is no smiling matter at all, this new energy source for lifting the burden of toil from the backs of mankind and raising

men to a plane of well-being hitherto undreamed. It is not a smiling matter because such a tremendous change in the common man's condition cannot be effected without social transformations of the very first magnitude. The history of the world since the French Revolution has been the history of the Industrial Revolution, which is, at bottom, the story of steam. But the steam engine is a little boy's wooden locomotive against the harnessed atomic engine of the future, and the difference in resultant industrial and economic revolutions should be the same.

That is why it is only part of the story to speak of atomic power as an "awful agency" of war between the nations. Atomic

power in peacetime engines may easily become the source of domestic convulsions. The atomic engine may become the nucleus of a revolutionary economic theory which in the hands of a fanatic may destroy as many lives in civil strife as the atomic bomb against foreign enemies. Your theorist will insist that men can now provide themselves with all the comforts of life by working ten minutes a day, and every economic and social system which hesitates to rebuild itself on that basic work schedule must be liquidated at once.

Forces
Behind
War

Let us recall how Marxians up to only the other day have explained all wars arising from the inner contradictions of a

"moribund" capitalism. For the duration of the war against Germany this definition was suspended but it is beginning to come back. But if the death throes of a social order plunge humanity into wars what will happen when the new socialist or communist order has been rendered moribund by harnessed atomic power?

It amounts to saying that the minds and consciences of men, in Mr. Churchill's phrase, must deal with the defense of home peace as well as international peace in the presence of our new tremendous physical agencies. Men can destroy themselves in civil wars and "social experiments" as quickly as in foreign wars.

The
Credit
Side

Man armed with a stone axe or man armed with atomic power will always fall back on the argument of the Somehow Good. When the

burdens and horrors of war are upon them men cry out against war. Later they show no hesitation in accepting the benefits of war. It was under the stress of war that men embarked on the research that has unleashed atomic energy. This war incentive is likely to be forgotten when the atom is harnessed for man's happiness instead of for his destruction.

To talk about limited, almost parochial pre-atomic subjects, there is the "imperialist" war of 1914-18 as the first World War is regularly called in Russian Communist terminology. It was this imperialist war which shattered the Russian empire and brought in communism. How many Soviet leaders today find themselves wishing that humanity had been spared the agony of that first World War?

DAWN OF THE ATOM ERA PERPLEXES WASHINGTON

Relief Over Tokyo's Surrender Offer Tempered by Wonder About Future

By JAMES RESTON

WASHINGTON, Aug. 11—The atomic bomb has done more than produce the surrender offer of Japan. More even than that surrender itself it has startled Washington into a realization of the magnitude of the problems of victory at home and abroad.

For in that terrible flash 10,000 miles away, men here have seen not only the fate of Japan but have glimpsed the future of America. Before they had wholly synchronized our political and economic institutions with the age of steam, and while they were arguing over the urgencies of the age of air, they were suddenly confronted with the shadow-shapes of the age of the atom.

That is why the immense sigh of relief at the offer of surrender has been tempered here by solemn reflection on the future.

The residue of war under the conditions of other generations was bad enough, as we know from the aftermath of the War Between the States and the first World War. But this time we have the residue of war and a vast industrial and social revolution all at once and in the moment of victory men are wondering more even than they are rejoicing.

Looking to Tomorrow

What are they wondering about? Well, they are wondering about a great many things they have taken for granted for a very long time. On the basis of today's news and tomorrow's possibilities, they are wondering about old ideas and old prejudices and even about what they had assumed were old truths.

They are wondering about the myth of the "immunity of the oceans." They are wondering what happens to the old theories about States' rights and labor's rights and management's rights and the farmer's rights in the atomic age.

They are thinking vaguely of the immediate responsibilities of the victor, of the occupation of Germany and Japan, of Americans controlling dozens and probably scores of islands in the Pacific Ocean, of Americans sitting on commissions that decide what ships pass through the Dardanelles and who controls the Danube, and what can and cannot move through the Kiel Canal, and who votes in Poland.

It is a time of questioning in

Washington. Some men are disturbed by the forms of the unknown and others are inspired by the challenge. How are men to be employed in an era of atomic power when we could not even employ them in the age of electricity? Can we adjust our minds and our institutions to an increase of power that is so great that even now, without atomic power, we can produce as many goods as we did in 1920 with 12,000,000 fewer workers?

How are men who are full of prejudice and fear and selfish national desires to live together in a world that has atomic bombs but that has no generally accepted rule of law?

New Avenue of Thought

It has been cool in Washington this week. One night it was down below 70, which is good sleeping weather for this town in early August. But thoughtful men have not been sleeping very well this week. They have been thinking about some of these questions. They have been thinking not in the ancient thought-patterns of this political community but of broader horizons. They have been thinking not of convenience but of existence. The change is marked and significant.

Several immediate problems are obvious. A decision must be taken about the size of the occupation forces in Europe, Japan and the Japanese islands and about the size of the standing Army and Navy we wish to keep. Only when this is done can the vast problem of demobilization be carried out in the most orderly and effective manner.

The size of our contribution of forces to the International Organization will have to be negotiated and approved by the Congress as one of the several steps necessary to implement our ratification of the San Francisco Charter.

Broad and imaginative steps will have to be taken to reconvert our industry from the tasks of war to the functions of peace and to transfer our economy in such a way as to encourage the highest possible level of employment.

Problems on Giant Scale

Legislation will be necessary to tide over those men who are unemployed while the gigantic swing-back to peacetime industry is be-

"IN THE PALM OF HIS HAND"



Doyle in The Philadelphia Record

ing accomplished, and the most careful agreements will have to be made with other industrial States so that the general reconversion of the United Nations does not degenerate into a scramble for raw materials, shipping and export markets.

Similarly, the race between essential supplies and anarchy in the defeated and devastated areas will have to be carefully planned if the United Nations are not to find themselves attempting to administer millions of starving and desperate men whose return to something resembling orderly conditions is in our primary interest.

Post-War Foreign Policy

In the political field there remain, now in the most urgent state, all the vast problems of working out a post-war policy with Russia and the British Commonwealth, among others, and all the intricate problems of the peace settlement ranging from the disposition of the Italian and Japanese colonies to the future of Korea and the Ruhr.

But beyond these pressing questions lie several which, in longer range, are equally as fundamental. Two of these will serve to illustrate the sort of problem that has been thrown up by the staggering events we have passed through in the last few days.

First, what happens to the United Nations' Security Organization in a world of atomic bombs? A week ago it was generally con-

ceded here that the political realities of the world made it impossible to go farther than the San Francisco Charter goes toward creating an international organization that could force all nations, large as well as small, to abide by fixed rules of international law.

Just the Beginning

Today many men here are becoming convinced that in spite of these political realities, the scientific and military realities since the atomic bomb necessitated our creating, or at least working far harder than we have in the past toward the creation of, such a rule of law in the world.

The mere possession of this bomb by the United States, Britain and Canada undoubtedly will strengthen the diplomacy of these three countries in any attempt they may make to help organize the world in accordance with their principles. But first they must decide together how they want to organize the world and whether the time has not come for them to reach a much closer military and political understanding than they have ever thought necessary or possible in the past.

In short, the end of the war is just the beginning. We have fought and won the freedom to work out our own future. But it must be worked out not in the old world, which is gone, but in a new world which will test our character equally as much as did the war itself.

WHAT THE ATOMIC BOMB MEANS—A DIGEST OF OPINION

N.Y.T.

THE PROMISE

8/12

The fact that we can release atomic energy ushers in a new era in man's understanding of nature's forces.—*President Harry S. Truman.*

The real significance does not lie in the fact that this new bomb has accomplished an almost incredible feat of destruction, important as that fact may be; its significance is that this bomb is a sign which all can appreciate that the basic problem of the release of energy by atomic fission has been solved and that the unbelievably large amounts of energy which scientists have long believed to be associated with matter can now be made available for practical use.—*Munitions Minister C. D. Howe of Canada.*

Plans for machines to use this force have already been patented. In industry it will bring a fabulous revolution. Doubtless we shall no longer have to seek far and wide the raw materials coveted by nations. For now the new alchemists will have tools for the transmutation of materials not only theoretically but practically.—*The Duc de Broglie, French physicist.*

The new era of atomic power can be subjected to a process of development that can be evolutionary rather than revolutionary.—*Statement prepared by Princeton University physicists, chemists and engineers.*

Fortunately, nature is completely impartial, even when her most terrible secret is wrested from her. The power wrapped up in a single bomb which can explode with the force of 20,000 tons of TNT may some day do the work of many thousands of men.—*The Pittsburgh Post-Gazette.*

THE WARNING

This revelation of the secrets of nature long mercifully 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.—*Winston S. Churchill.*

There are problems here calling for statesmanship of the highest order. Establishment of any organization for the maintenance of world peace and security would obviously be sheer mockery if means could not be found of guaranteeing the effective control of an instrument of war of such potency.—*Sir John Anderson, in charge of atomic bomb research for the Churchill Government.*

[The atomic bomb] is a challenge to every element of our national life, but most of all to organized religion.—*Dr. Earl F. Adams, executive director of the Protestant Council of the City of New York.*

Such power of destruction would have been a social hazard

even in the civilized thirteenth century. Our savage generation cannot be trusted with it at all. It is a triumph of research, but unfortunately it is also a superb symbol for the Age of Efficient Chaos.—*The Rev. Robert I. Gannon, S. J., president of Fordham University.*

The last twilight of the war is colored by mortal flames never before seen on the horizons of the universe, from its heavenly dawn to this infernal era. This incredible destructive instrument remains a temptation, if not for horrified contemporaries then for posterity, to whom history—we know it very well because we are the posterity of yesterday—teaches very little, and which the forgetfulness of experience dominates so willingly.—*Il Osservatore Romano, Vatican City newspaper.*

THE BIG JOB AHEAD

It will be a matter of much research and development to design machines for the conversion of atomic energy into useful purposes.—*Secretary of War Henry L. Stimson.*

In time, a long time, [utilization of atomic energy] will be developed for peaceful pursuits, but it will undoubtedly be generations before the atom will make all of the nation's steel, power the nation's locomotives, generate the electricity or furnish the billions of hours of industrial horsepower that coal does now, let alone the nation's homes.—*Dr. M. Delyn Branin, technical consultant of the Bituminous Coal Institute.*

The potentialities of this first harnessing of atomic energy are unlimited [but] it will probably be many a year before engineers can think of substituting U-235 for coal and oil. If that high stage of technology is ever reached we need not picture a world with power plants very different from those we have. Steam will be raised by the heat of atomic energy, with turbines still turning generators, so far as we can see now.—*The New York Times.*

THE POWER OF RESEARCH

Both science and industry worked under the direction of the United States Army, which achieved a unique success in managing so diverse a problem in the advancement of knowledge in an amazingly short time. It is doubtful if such another combination could be got together in the world. What has been done is the greatest achievement of organized science in history. It was done under high pressure and without failure.—*President Harry S. Truman.*

Behind these concrete achievements lie the tremendous contributions of American science. No praise is too great for the unstinting efforts, brilliant achievements and complete devotion to the national interest of the scientists of this country. Nowhere else in the world has science performed so successfully in time of war.—*Secretary of War Henry L. Stimson.*

The destructiveness of the atomic bomb illustrates what science and scientists can do when they are properly financed, organized, coordinated and urged.—*The Boston Herald.*

THE STORY BEHIND THE ATOMIC BOMB

NYT 8/12
By WALDEMAR KAEMPFERT

Under the pressure of war the most powerful destructive weapon ever invented has been given to man for better or for worse. In three years organized science reached a goal for which even the romantic utopians allowed at least half a century. How was it done? The answer is partly given in scientific literature and in the disclosures of official reports so that it is possible to piece together a story without a parallel in the history of science.

First of all, a material had to be selected which would take the place of the highest of high explosives. Secretary Stimson casually mentions "uranium ore."

Germans Were First

The hint takes us back to 1939. In that year Drs. Otto Hahn, E. Strassmann and Lise Meitner, all German subjects, electrified the world with the announcement that they had succeeded in breaking up the uranium atom and in the process released a staggering amount of energy—the first time that more energy was extracted from an atom than was put into it for the purpose of disruption.

Every military power took notice of what had been done by the German group. What Secretary Stimson calls "the battle of laboratories" began in 1940 and, hence, before the assault on Pearl Harbor. Germans, British and Americans were contestants. The winner of the scientific battle would win the war.

By 1941 actual research began in this country under the direction of the Office of Scientific Research and Development and in Great Britain under a corresponding body. In June, 1942, American work was transferred to the War Department with Maj. Gen. Leslie R. Groves as the directing officer and a policy group consisting of Henry A. Wallace, Secretary Stimson, Gen. George C. Marshall and Drs. James B. Conant and Vannevar Bush as counselors. In Great Britain there was a similar coordination of effort and supervision.

On Oct. 11, 1941, President Roosevelt suggested to Clement Attlee (then a member of the Churchill Cabinet) that the two countries pool their knowledge and their efforts. Great Britain consented. Because we were safe from Hitler's bombers the foremost English physicists and some high staff officers came to this country. So it happened that the best scientific brains in two democracies concentrated on the atomic bomb.

Uranium 235 Chosen

First of all the group had to decide with what material the bomb should be loaded. Several forms of uranium were known. They are called "isotopes," meaning that they occupy the same place in the table of elements. Three are designated 234, 235 and 238, their atomic weights. At the top of the table of elements stands hydrogen, lightest of all, for which reason its weight is 1. Uranium 234, 235 and 238 are respectively 234, 235 and 238 times heavier than hydrogen.

Of these variants or isotopes of uranium it was known that only 235 could be used. In a ton of uranium ore there are only fourteen pounds of 235, and these few

Vast Enterprise of Governments Found The Great Secret

pounds are intimately mixed with other isotopes. Naturally, the official accounts are silent on separation, so that the best we can do is to indicate what was either done or suggested before the war.

A method was devised in 1938 by two Germans, Clusius and Dickel. The Swedish scientist, Krasny-Ergen, improved on their technique.

Before the war over 191 years would have rolled by before a single gram of U-235 was obtained, and 75,000 years for a single pound.

From all this it is fair to infer that the research group must have devised a much speedier method. There are explosives so much higher than TNT that they have to be diluted. It may well be that it proved desirable to retain a large amount of "impurities" in 235. If so, the problem of concentration was simplified.

It was necessary to ask Congress for money to build laboratories and plants. No questions could be answered. Yet Representatives and Senators appropriated \$1,950,000 up to June 30, 1945, on the mere request of Secretary Stimson and the Chief of Staff.

Three Plants Built

There are two atomic-bomb production plants and one laboratory. Their size impresses even a nation that is accustomed to vast industrial undertakings. One plant, the Clinton Engineering Works in Tennessee, sprawls over 59,000 acres or more than ninety-two square miles. Within the reservation the Government created the city of Oak Ridge to accommodate a population of 78,000 workers and their families. Even this was not enough, because Secretary Stimson speaks of others who "live in immediately surrounding communities."

The second plant is the Hanford Engineering Works, northwest of Pasco, Wash., which covers 430,000 acres or over 662 square miles. Here again a Government-owned town, Richland, had to be created for 17,000 workers and their families.

Lastly, there is a laboratory near Santa Fé, N. M., where Dr. J. Robert Oppenheimer is in charge, a man to whose "genius and leadership" Secretary Stimson pays tribute. What goes on there only a few in the Government know.

According to President Truman, over 125,000 were employed in the earlier and more feverish stages of the bomb's development—a great army mobilized to solve a scientific problem.

Nature of the Bomb

What of the bomb itself? This much is certain: it must contain not only uranium 235 in sufficient concentration but some means to split it and make it give up its energy in an explosion. The usual detonators will not do. There is nothing for it but to follow the methods laid down before the war.

When Drs. Hahn, Strassmann and Meitner bombarded uranium with neutrons they used the only suitable projectiles. Alpha par-

ticles (helium nuclei), protons, deuterons, electrons are all electrically charged. But the atom is surrounded with electrical defenses that are not easily penetrated. Charged particles are simply sucked in, and it is seldom that one reaches the nucleus and chips it. A high-speed proton, for example, would have to pierce the electrical defenses of about 100 million atoms before it hit a nucleus. A stream of such protons is stopped after having passed through the defenses of only 100,000. It follows that the chance of scoring a hit is only one in a thousand.

Role of the Neutron

But the uncharged neutron is different. It can slip through the electric defenses of a uranium atom, with one chance in 140 of hitting the nucleus. When that occurs the two splinters obtained are no longer uranium but barium and krypton, a rare gas in the atmosphere. In other words, we have transmutation. Emission of energy and transmutation always occur together. The mass of the krypton and barium is less than that of the original uranium atom. The rest appears as energy—enormous energy. A neutron with an energy of only one thirtieth of a volt can release 200,000,000 volts.

It is plain that the bomb must contain a bombarding mechanism. And this mechanism must slow down the neutrons. Fast ones are not effective. To produce neutrons it was the practice before the war to bombard beryllium in a cyclotron. Thus activated the beryllium shot off neutrons some of which hit the uranium atoms. To slow the beryllium neutrons down hydrogen was used in the form of water, paraffin, cellophane or some other substance.

New Technical Additions

It is clearly a major technical performance to build into a bomb some way of making an appropriate element give up its neutrons. A cumbersome cyclotron that weighs tons cannot be packed into a bomb. We must assume that the

research scientists devised a much simpler mechanism.

Now that we have our bomb the next step is to test it. Brig. Gen. Thomas F. Farrell has given us a vivid account of what happened at Almgordo Air Base, 120 miles southeast of Albuquerque, N. M., on July 16. Rain poured down in torrents and lightning cleft the sky. The bomb hung from a steel tower.

The First Test

Ten thousand yards, or over six miles, from the bomb was the control tower. Outside watchers lay prone on the ground. Dr. Oppenheimer leaned against a post, the most anxious man in the group of observers. "Now," said Dr. Oppenheimer at precisely 5:30 A. M. There was a blinding flash, a roar, a heavy pressure wave that knocked down two men in the remote control tower. A tremendous cloud of dust and debris rose in the shape of a ball and mushroomed out at 40,000 feet—much the same effect later observed in Japan. When the blast was over the steel tower was gone.

Secretary Stimson says that "in their present form these bombs are now in production and even more powerful forms are in development." What the output may be we have not been told. Consider-

ing the devastation wrought during the test in New Mexico and the obliteration of 60 per cent of Hiroshima at a single blow, a few thousand bombs are all that might have been needed in reducing the Japanese islands to a state of utter ruin.

The Future

What of the future? There is an official expression of awe, a realization that a weapon has been invented which cannot be placed in the hands of reckless Governments, a promise by Secretary Stimson that an international commission is to decide how and by whom the bomb may be used. But there is also the hope that some day atomic energy will be more efficiently harnessed, so that we can have either a trickle or a Niagara.

"Already in the course of producing one of the elements much energy is being released, not explosively but in regulated amounts," says Secretary Stimson. This in itself is much. But the Secretary adds that the energy, which manifests itself as heat, is "at a temperature too low to make practicable the operation of a conventional power plant." We may have to wait twenty, thirty, even fifty years before atomic energy competes with coal, if we rely on the old haphazard method of research.

PATTERN OF FUTURE WAR IS CHANGED

By SIDNEY SHALLET

WASHINGTON, Aug. 11—The entire future pattern of warfare, on land, sea and in the air, was violently altered this week by a single explosion—the explosion of that first atomic bomb that fell upon the Japanese city of Hiroshima and successfully accomplished its macabre but necessary objective.

This was the opinion made plain by the United States official spokesmen, and also voiced privately by a number of thoughtful, military and scientific authorities, both in this capital and elsewhere in the country where the secret of atomic energy is being progressively unfolded. President Truman phrased it more forcefully, perhaps, than anyone when he declared in his solemn broadcast of Thursday night that the atomic bomb was "too dangerous to be loose in a lawless world."

Even the boldest military authority is not prepared yet to answer in detail how the harnessing of atomic energy will affect the armies, the navies and the air forces of the next generation. Some feel that "this awful responsibility which has come to us," as the President candidly described the atomic bomb, may prove to be the Frankenstein's monster capable of destroying civilization, while others feel that, under wise control, it may prove civilization's great boon. No voice has been heard, however, that disputed that the "age of atomic energy" foreshadowed radical revisions in the art of war as we know it today.

Blow at Isolationism Seen

Although none but the most basic scientific facts have been revealed concerning the method by which the atomic bomb was created, Washington and London have clearly highlighted the terrible and unmistakable significance of this new discovery. This has been a deliberate policy on the part of the United States and Great Britain, for the present leaders, carrying on the broad policies that were formulated by the late President

Atomic Bomb Upsets All Calculations of Military Men

Roosevelt and former Prime Minister Churchill, realize that all the people must understand the tragic and limitless implications of this new weapon.

It would be a safe assumption that one of the primary concerns of our leaders now is that there never again must be a world in which the people of the mighty nations would be blind to the dangers of isolationism, complacency and military or scientific unpreparedness.

Basic Considerations

In weighing the effect on the future of warfare, these basic facts may be considered:

(1) The harnessing of atomic energy has produced an explosive vastly more potent than anything previously known. The first bomb was more powerful than 20,000 tons of TNT.

(2) The development of atomic energy still is in its infancy both as to (A) scope of power, and (B) scope of production. Our leaders have assured us there would be even more powerful developments of atomic energy as a military weapon, and that we were taking steps to guarantee our ability to produce.

(3) In addition to this more powerful future form of atomic energy, which will dwarf the present explosive, scientists have made it clear that atomic energy was a source of propulsion power. It requires little imagination to visualize what this may lead to—robot bombs, both propelled by atomic energy and carrying the atomic explosive in their war-heads; giant planes light in weight because of limitless power provided by atomic energy, carrying great loads of atomic explosives; warships and submarines capable of patrolling indefinitely and of fighting with the new weapon possibilities in the field of sabotage that are too frightening and too dangerous even to discuss.

After weighing and accepting these possibilities—and it is not too fantastic to accept them in view of the "impossible" things that have been perfected in the relatively brief span of this war—it is possible to speculate on the effect that the discovery of the atomic energy may have on tomorrow's armies and sea and air fleets.

Speculations on Possibilities

Since the discovery still is so new and so bewildering, however, such questions obviously must be largely speculative, for instance:

ARMIES—Will a nation that is able to control, or at least to keep ahead of other nations that are potential aggressors, the atomic field, need a standing or reserve army of millions, either for defense of its own shores, or counter-defense by invasion? Can a nation hope to defend its shores with a large army after it has been suddenly and devastatingly attacked by atomic bombs? Or will invasion as we know it now even be necessary after a nation in future wars? Although, so far as the present

war is concerned, the atomic bomb is too young to make much difference in the size of the army, there are some who think that the army of the future may be entirely different, both in size and function.

NAVIES—Will we need large navies of the carrier-battleship striking force pattern, backed up by the lesser warships, the submarines, and the intricate supply train system that has proved so successful in the present Pacific war? Can surface ships possibly protect themselves against atomic weapons? Navy leaders are giving this question deepest thought.

It is not likely that any naval spokesmen would concede any diminution of the need for a big post-war navy, but it is equally certain that, with the coming of the atomic age, the entire character of the future navy, particularly as an instrument of attack, will be changed.

AIR FORCES—The air force leaders probably feel the keenest affinity with this new weapon. It is essentially, in its present form, at least, and its most logical future apparent forms, a weapon of the air. It is known that some of the forward thinkers in the United States Army Air Forces have dreamed for a long time of what air power, plus atomic energy, could accomplish. There are leaders who look on the present Army Air Forces, incredible as this may sound, as a "small" and an "obsolete" organization, and who feel that land-based air power alone, when it "comes into its own," can win wars on its own. There is not even any question but that, whatever form the development of the power of the atom takes, the air force will be a willing and eager partner.

Grim Preview

Atomic bombing is in the war. It has given a grim preview—first at Hiroshima, and then at Nagasaki—of what it can do, and President Truman has told Japan that unless she quits, the first blows are "only a warning of things to come."

It may be stated authoritatively that the men who harnessed the energy of the universe for the United States are completely confident of the potentialities of the discovery as a weapon of war—and also, after much more painstaking research and development, as a weapon and a boon to peace. They know that it is almost inevitable that other nations will make advances in the same field, for Germany at the time of her defeat was experimenting feverishly toward the same goal.

These men feel, however, that, if the American people realize the supreme importance of this new discovery, and stand united in resolution to keep our research going, regardless of cost and effort, we can keep our lead and stay ahead of the world in the development of atomic energy. It is their sober judgment that if we do stay ahead of the world and if we are prepared to take firm action against nations that in the future may choose to advertise their intentions of ruling the world, we shall not regret that the age-old secret of the atom is a secret no longer.

ONE VICTORY NOT YET WON

Even the inevitable end of a great war cannot wholly lift from men's hearts the burden that was laid upon them last Sunday by the dropping of an atomic bomb on the Japanese city of Hiroshima. By their own cruelty and treachery our enemies had invited the worst we could do to them. Even so, no one could fail to realize that by this invention and this act humanity had been brought face to face with the most awful crisis in its recorded history. Here the long pilgrimage of man on earth turns toward darkness or toward light.

Even in the hot blood of war, seizing eagerly on any device that would shorten the conflict and save the lives of men and boys whom this nation loves, many of us must have hoped that all that was said about the atomic bomb was not true. Many of us must have hoped that there was an element of psychological warfare in the extravagant claims made for this most frightful of all human inventions since the beginning of time.

But the extravagance was justified. The atomic bomb is capable of all that has been predicted for it. Even more, it is in its infancy. This is the steam engine of Isaac Watts, the telegraph of Morse, the flying machine of the Wrights. This deadly two-billion-dollar toy is experimental. If its area of absolute and undreamed-of demolition is today represented by a circle with a diameter of two miles it will soon be more if we care to make it so and its ultimate destructive powers are beyond all imagination.

A new and awful meaning comes into the famous words of Prospero in Shakespeare's *Tempest*:

The cloud-capp'd towers, the gorgeous palaces,

The solemn temples, the great globe itself,

Yea, all which it inherit, shall dissolve And, like this insubstantial pageant faded,

Leave not a wrack behind.

Urban civilization might be wholly wiped out, and such population as survives at all reduced to the animal level of many thousands of years ago. Perhaps the secret of the atomic bomb would thus be lost, and after some thousands of additional years a kind of civilization would be restored. A week ago this kind of speculation would have seemed to most people like something out of a scientific romance. It is not so today. The most level-headed and prosaic of us must face a reality that transcends the dreams of Jules Verne and the early imaginings of H. G. Wells.

But in this shock that ran like an earthquake round the world there is room for hope, room for dreams of a nobler future for mankind. The atomic bomb was perfected for war, but the knowledge which made it possible came out of man's purest and most disinterested strivings. It came out of the deathless yearning to know and to use the gifts of nature for the common good. It came out of man's struggle to liberate himself from ignorance, to master his destiny, to lift the heavy burden of meaningless toil. This new knowledge can still be used for such purposes. It can bring to this earth not death but life, not tyranny and cruelty but a divine freedom. What dazzling gifts the science which split the atom can offer to the heavily laden everywhere! To take one instance, what cannot this science do for the millions of China and India, bound for so many ages in sweat and hunger to the wheel of material existence!

We have only to carry out the resolve, which surely every humane person on earth must have felt when he heard last Monday's news, that with the surrender of Japan this device must never again be used in war because there must never again be war. Is this torn and embittered world capable of living up to such a resolve? It has to be—or die. The San Francisco Charter is a beginning. All our hopes and strivings are only a beginning. The tramp of doom is at our doors but the stars of an eternal aspiration still shine.

The mysteries that have been solved do not reveal the inner secret of the universe, nor destroy our reverence in the presence of powers we cannot control. Bewildered humanity, with this awful instrument in its hands, may feel the ages-old impulse to pray—and rising from its knees to work humbly and unselfishly for the perpetual peace that is now our only salvation.

Gigantic Atom ^{NYT}

(1) The Discovery ^{8/12}

Last Monday—at 10:30 A. M.—the war's best kept secret was disclosed to the world. The White House issued a statement which President Truman had radioed from the U. S. S. Augusta on which he was returning from Europe. It read:

"Sixteen hours ago an American airplane dropped one bomb on Hiroshima. * * * That bomb had more power than 20,000 tons of TNT. It is an atomic bomb * * * a harnessing of the basic power of the universe."

There ensued an electrifying race to speed the news around the world. Supplementary information came from Secretary of War Stimson, from former Prime Minister Churchill, gradually from other sources which were allowed a cautious lifting of the veil of secrecy.

They told a story of intense drama, its threads reaching into many corners

of Europe, where both German and Allied scientists had been engaged in a desperate contest to extract the atom's secrets and bring them under control. It told of long struggles to produce in significant quantities the rare element which is the "raw material" of the new force—a form of uranium known as U-235.

Titanic Effort

It told of the mobilizing of scientific forces, first in Britain, then in the United States; of vast production plants built in remote sections; new communities totaling more than 95,000 persons springing up where there had been only scrub and wilderness before. In total, \$2,000,000,000 was spent; key scientists stayed in isolation for months, workmen "went on the wagon" lest they hint of what they were doing. President Truman said: "What has been done is the greatest achievement of organized science in history. It was done under high pressure and without fail."

The story behind the atomic bomb is one of long research. The wartime phase, with its dramatic climax last week, really began in October, 1941, when President Roosevelt and Prime Minister Churchill agreed to pool British and American research and resources, to shift the center of activities to the United States, where manpower and equipment facilities could better be spared, where German bombs would not be a danger.

Thereafter the task was one of mobilization and concentration. Military direction was headed up by Maj. Gen. Leslie R. Groves; civilian scientific efforts were controlled by Dr. Vannevar Bush as head of the Office of Scientific Research and Development. Columbia University became the nerve center. In scores of laboratories individual aspects of research were followed up—many of them blind alleys, some of them hopeful.

Starting Production

By the end of 1942 progress was great enough (though the goal was not in sight) to warrant a start of the huge production facilities that would be needed. The Allies knew the Germans were frantically at work, too; the race would go to the one that could get into actual production first. On a 59,000-acre reservation in Tennessee a city of 78,000 mushroomed in the hills; on a 430,000-acre tract in the State of Washington a town of 17,000 came into being. A special laboratory was established near Santa Fe, N. M. In dozens of factories special equipment was built.

Through it all, during nearly four years, barely a dozen persons knew what was going on. The code phrase

was "Manhattan Engineer Project." It was a phrase that quietly got draft deferments for more than 5,000 men; it commanded unquestioned priority for materials, travel, anything else that was required.

The Germans tried desperately for any scrap of information. They failed. By contrast, Allied intelligence officers, underground patriots—especially in Norway—the RAF and the Eighth Air Force waged steady and effective war on every traceable effort the Germans were making.

(2) The Future

The atomic bomb that burst over Hiroshima last week promised to revolutionize the art of war—if there should ever be war again—and to open a new industrial age. That age, as Secretary of War Henry L. Stimson said, may still be twenty, thirty, even fifty years away, but the discovery was almost incomprehensible in its implications.

What the bomb means in terms of warfare could be surmised. Armies, navies and air forces may not disappear, but they seem likely to lose forever their decisive value. The bomb used against Japan was carried by a conventional plane—subject to interception by air or ground fire. In the future it would most likely be carried in a stratospheric projectile like the German V-2, too fast to be seen, much less stopped. Used in quantity, atomic bombs might launch a war that would be over "in three hours." Eight of those used against Japan would, if properly placed, wipe out Manhattan Island. More powerful ones might destroy the key industrial centers of a nation in a single perfect salvo.

From another viewpoint warfare is changed. Since the age of steam began, strategy has hinged on possession of or access to a few basic raw materials—coal, oil, iron—to build ships and weapons, to carry war to the enemy.

With last week's announcement the lid of secrecy came only part way off. Technical processes, the bomb mechanism, were still kept dark. But workers who had seen tons of material going into the plants but "nothing coming out" understood. Secretary of War Stimson in a detailed report could publicly praise the efforts of universities, industry, the scientists, the military, the workers.

Three Tests

Scientists and military men have had but three opportunities to study the effects of the atomic bomb. The first was at a test in the New Mexico desert on July 16; the second and third were the bombings of Hiroshima and Nagasaki last week.

Only at the New Mexico test were they able to observe the explosion and then examine the site. In a setting of eerie isolation, with a sense of "reaching into the unknown" and "not knowing what might come of it," officers and technicians worked two days carefully assembling components brought separately from scattered points. Tension mounted steadily, to a pitch "which will live forever with a man." At 5:30 an automatic mechanism detonated the charge. There was a flash, a roar, a great pressure wave—then silence. A spokesman said: "The feeling of the entire assembly, from the initiated, was one of profound awe."

Their precise findings were kept secret, but the titanic force unleashed could be judged by fragmentary reports. These included:

A steel tower from which the charge was suspended was "vaporized"—not simply torn apart but annihilated.

Where the tower had been a "huge" crater remained, so deep and broken that specially equipped tanks were used to explore it.

The earth not blown away was fused to a glasslike substance; one scientist said the heat would have to be calculated "in billions of degrees."

A pillar of dust shot 40,000 feet in the air—nearly eight miles—in five minutes.

Several men standing behind a shelter 10,000 yards—nearly six miles—from the explosion were knocked off their feet.

A blink of searing, unearthly light—many times the intensity of the midday sun—lit up desert and mountains for miles around.

An earth shock was felt 250 miles away, the air blast 150 miles away, the heat blast more than 100 miles.

Vast Power

In addition to these details there was President Truman's statement that the first bomb dropped on Japan had contained an "exceedingly small" quantity of the vital material. In unofficial circles estimates of the actual quantity ranged from one to twenty-five pounds. By contrast, just the week before, it had taken more than 800 B-29's to carry 6,000 tons of bombs on the heaviest raid ever made.

The precise effects of the bomb in action will not be known until Japan is occupied and the targets are studied. Hiroshima, the first one hit, will afford the nearest to a definitive test, since it had never been bombed previously.

The men who made this attack had a colorful and dramatic report to make. It seemed clear the bomb had been dropped by parachute, to slow its descent and allow the plane to clear the blast zone. Even so, and even though the plane swung away at full throttle, the men felt two hard "slaps" like close anti-aircraft bursts. They saw the heart of Hiroshima disappear "in a great black cloud of boiling dust and churning debris . . . smoke climbed like a mushroom to 20,000 feet. A few fires were visible around the edges of the smoke but we could see nothing of the city except the dock area, where buildings were falling down."

PRESS REVIEW

Atom Bomb: Future Hopes and Fears

This is a digest of editorial discussion of major topics by New York newspapers during the week.

ATOMIC BOMB: No newspaper was particularly happy over the first use of the atomic bomb. There were obvious implications that its discovery by nations other than its present possessors—the U. S. A., Britain and Canada—could threaten humanity's very existence.

The *Post* suggested there could be no defense against the atomic bomb except a peaceful world. The *Times* said the advent of the bomb meant that the world must revolutionize its political thinking if it intended to survive. The *Times* and the *Herald Tribune*, groping, as almost everyone did, for a peacetime use of the forces released in the bomb, expressed the hope that atoms could be used as a source of constructive energy rather than a means of the self-destruction of humanity.

The *News*, ignoring the Treaty of Ghent, which, in 1815, smoothed of the differences of the War of 1812 and ushered in 130 years of peace between Canada and the U. S. A., and the Rush-Bagot Treaty of 1817, which demilitarized the U. S.-Canadian border, said the biggest deposits of uranium ore, which is refined into the motivating force of the atomic bomb, are in Canada. If Canada doesn't become the exclusive ally of the U. S. A. as far as uranium is concerned, "enough patriotic Americans can probably be found to see to it that Canada does the right thing by us and by itself with its uranium."

The *Sun* was quick to point out that the bomb, now available for use against Japan, could be used in another conflict to pulverize all the cities of the world—including ours.

Karl H. von Wiegand, Hearst's "dean of foreign correspondents," cabled from Madrid that some secrets of German experiments on atom splitting for military purposes had got into Russian hands, reportedly through a Prof. Lange, who was attached to the Berlin atom-splitting laboratories of the German General Electric Co. Von Wiegand's piece, which reminded the readers of the fate of Atlantis (the lost continent) appeared locally in the *Journal-American*.

PM took the attitude that the harnessing of atomic energy promised great booms to mankind in the future, but that at present it rendered new wars impractical by providing means for man's self-annihilation.

RUSSIA: Russia's declaration of war against Japan brought the metropolitan dailies out with extras. Editorially the Soviet's help was welcomed by the more conservative press, accepted with little grace by the Patterson-Hearst papers.

The *Herald Tribune* said Russia was fighting Japan "as an ally of mankind" and called the Soviet's action the first great "police action" of the contemporary world and the first achievement of the United Nations Charter. The *Times* noted particularly that President Truman's report on the Potsdam Conference made it clear that Russia had agreed to enter the war against Japan without prior knowl-



Lord Louis Mountbatten

Dashing Lord Louis Francis Albert Victor Nicholas Mountbatten, C-in-C in southeast Asia, looks more like an actor that he does a fighter, but he's had one of the most varied naval careers of any man who has reached no more than his 45 years.

Mountbatten, a great grandson of Queen Victoria and son of Admiral of the Fleet, the 1st Marquess of Milford Haven and Princess Victoria, a granddaughter of Queen Victoria, went to sea as a "snotty" (midshipman) at the age of 13, came up through the grades as a signaler, submarine man, captain of battleships, expert on small ships, commander of an aircraft carrier, chief of Britain's famous commandos, chief of the Madagascar operations and finally, Supreme Allied Commander in southeast Asia.

Lord Louis, who liked small ships, came to New York in 1942 to take command, much against his will, of the aircraft carrier, HMS *Illustrious*, which had been damaged in the Mediterranean and brought to this country for repairs.

Mountbatten had the pleasure of taking over when Gen. Joseph W. (Vinegar Joe) Stilwell left off when the Japs poured across Burma and crossed the border into India, inflicting on us what Stilwell called at the time "a hell of a licking."

On May 4 Lord Louis was able to announce: "The Burma campaign is at an end." The Japs had suffered 347,000 casualties, 97,000 of them dead.

Mountbatten, who likes going night clubbing with his pretty wife when he isn't busy with other things, now has 1,000,000 Indian and British troops under his command.

edge of the existence of the atomic bomb—which of course, doesn't agree with what Karl H. von Wiegand says Prof. Lange supposedly told the Russians.

The *Mirror* and *Journal-American* were shocked by Russia's entry into the Pacific war—especially the *Journal-American*, for on Wednesday, when Russia entered the war, Mr. Hearst's downtown sheet reported the fact on page 1, but said editorially on page 16:

"If there was a discussion (at Potsdam) of the Pacific war, it is not reported. If there was a DECISION made about it—par-

ticularly about Russia's future part in it—it remains a secret."

The following day the *Mirror* and the *Journal-American* editorial writers decided Russia had entered the war because "IT IS TO HER GREAT INTEREST," because she wants to "share in the spoils." Furthermore, they said, all Russia had done was make a formal declaration of war.

The forcefulness of the last remark was watered down by a page 1 headline in the *Mirror* which said: "REDS SMASH 14 MILES INTO MANCHURIA."

The *World-Telegram* said Russia stood to gain more than any other nation from Japan's defeat, which had been assured by the U. S. A. virtually alone.

The *Journal-American* added that because the Allies wouldn't do their share the U. S. A. "continues to furnish more than 90 per cent of the men and equipment for the Pacific war, with Russia, Britain, France, Holland and the other countries, standing by, ready to claim the possessions they once held and demand new ones."

(The Red Banner Army which the Russians have put in motion on the Manchurian front is estimated conservatively to number 1,000,000 or more men. The British Information Service says Admiral Lord Louis Mountbatten (See Col. 4), Supreme Allied Commander in southeast Asia, has at least 1,000,000 men—two-thirds of them Indian troops, the rest British—under his command. British naval forces in the Pacific are estimated to include 200 or more ships at present and are expected to include 400 or more soon.

(Last May 28 Admiral Chester W. Nimitz, speaking from the quarter deck of HMS *King George V* and reviewing the part the British Navy had played in the Okinawa campaign, mentioned that stories had been circulated that the British were not wanted in the Pacific war, as it was a private American show.

(Nimitz said: "I do not know what prompts such stories, what it is that makes a man want to stir up trouble, but there are people on our side, who, either maliciously and wilfully, or through ignorance, not knowing any better, not having anything better to do, take keen pleasure in starting yarns like that.")



Bomb views

ON TUESDAY AFTERNOON, while we were still trying to absorb the shaking news, we called up some creative people and asked what *their* reactions had been when they heard about the atomic bomb. They said:

Maxwell Anderson, playwright: My first reaction was an obvious one. I have two sons in service, and I hoped the bomb would help shorten the war. But at the same time I felt a great apprehensiveness. This new bomb, you know, is a very dangerous plaything for civilization.

Alfred Kreymborg, poet: My only hopes are that we'll use it to make all the progressive plans for human betterment a reality, and that we don't unconsciously misuse it to destroy ourselves.

Lillian Hellman, playwright: I'm very pleased, very proud, very disturbed. I can't make any serious comment, however, because the newspaper reports are a little too pseudo-scientific to be completely dependable.

Virgil Thompson, composer and music critic: Speaking as a musician, I'm sure the bomb makes a noise that is quite majestic. Any further comment would be entirely out of my professional sphere.

Edward Laning, painter: The power which this new weapon suggests reduces more than Japanese cities to rubbish. It makes rubble of all the old excuses for poverty, disease, and exploitation. The atomic bomb dramatizes the problem that we can all live in peace and security. But to do this we've got to give up the luxury of power over other men.

William Rose Benet, poet: Perfectly overpowering. I hope its immediate result will be to shorten the war. But I'm afraid that eventually, when atomic power replaces coal and oil, there will be a new industrial revolution bringing with it a tremendous employment problem. There should be no reason for this, however, if society and industry adjust themselves properly.

Robert Ardrey, author of the play Thunder Rock and of Worlds Beginning, a novel about the future: This may be a very very good thing. It puts humanity on the spot, it's the final threat, the end of the technological road. Now you are sensible and learn how to use it for good—or you use it in another war and annihilate yourself. . . .

The atom bomb is too terrible to trust in private hands, too terrible to trust even in your own nation's hands. So perhaps you put it in the hands of the United Nations organization, the safest place for the thing that is bigger than any army or navy anybody can build. If you do this, you've created a kind of central world's state and equipped it with the greatest power we know.

N.Y.T. 8/12

FRENCH FLED NAZIS WITH ATOM BRAKE

Scientists Caught One of Last Ships to Britain Carrying Heavy Water From Norway

By Wireless to THE NEW YORK TIMES.
LONDON, Aug. 11—One pound of uranium, the element employed in atomic bombs, is equivalent in explosive power to as much as 8,000 tons of TNT, according to reports issued today by the British Department of Scientific and Industrial Research which explains Britain's part in the development of the atomic bomb.

The story, outlined in cold, scientific terms, relates dramatic incidents dating from 1940 to the first atomic bomb descended on Hiroshima in Japan.

For instance, the report includes the fact that one of the strangest, yet most valuable, items salvaged from France in 1940 was 165 liters [about forty imperial gallons] of "heavy water." This was practically the world's entire stock of this material and it was brought to Britain by two French scientists so experiments in atomic energy could be continued.

The report gives the British part of the research that resulted, through the cooperation of Canada and the United States, in the development of the atomic bomb.

As early as the winter of 1939, British and French scientists had been delving for the secret of an atomic bomb. Part of the research was carried on in Cambridge and other centers of learning in Britain and part in France. When the collapse of France was certain, physicists who were working in cooperation with British scientists immediately moved to transfer their work to Britain, bringing the heavy water with them.

Heavy water is a compound of oxygen and "heavy hydrogen," or deuterium, a variety of hydrogen gas in which the proton [or nuclear portion of each atom] has double the weight of hydrogen. "Heavy water" was needed as a "slowing-down" medium in the process of splitting the atoms of uranium.

The new science of nuclear physics had reached an advanced stage by 1940 so far as production of nuclear fission, or atom-splitting was concerned. By this means it was known that enormous energy could be produced explosively.

Scientists of many nations had learned by successive stages that the nucleus of the uranium atom could be split by bombarding it with rays from certain radioactive elements.

Problems still to be solved included quantity production of the material and control of the explosive effect produced by sudden nuclear fission. Heavy water was needed for the latter purpose.

Daladier Ordered Mission

LONDON, Aug. 11 (AP)—The dramatic flight of two French scientists to England in 1940 with a supply of "heavy water" was disclosed tonight by Prime Minister Attlee.

In the spring of 1940 a secret French mission sent by Premier Edouard Daladier slipped out of Norway past German spies with the heavy water for French scientists, among them Frederick Joliot-Curie.

The German invasion came soon and the heavy water was carried on one of the last ships to leave Bordeaux by the French scientists Halban and Kowarski and placed at the Allies' disposal.

In Paris today Reconstruction Minister Raoul Dautry, who was Armaments Minister in 1940, said "we learned later that the Germans tried to intercept the mission" of technicians sent to Norway for the heavy water. The Norwegian scientist who gave the heavy water to the French refused to accept payment, although he said: "I will be shot by the Germans if it is known what I have done."

N.Y.T. 8/12

THE NEW YORK TIMES, SUNDAY, AUGUST 12,

ATOMS NOT OCCULT, EINSTEIN DECLARES

Physicist Explains Nuclear and Solar Energy, but Refuses to Discuss Use in Bomb

By RICHARD J. LEWIS
Albany Times-Union Staff Writer.

SARANAC LAKE, N. Y., Aug. 11 (AP)—"No one in the world should have any fear or apprehension about atomic energy being a supernatural product," Prof. Albert Einstein, noted theoretical physicist, said last night.

"In developing atomic, or nuclear energy, science did not draw upon supernatural strength," he explained, "but merely imitated the reaction of the sun's rays."

In a thirty-minute interview at his summer residence, the Knollwood Club, Professor Einstein declared:

"Atomic power is no more unnatural than when I sail my boat on Saranac Lake."

I called his attention to a statement that followed the atomic bombing of Hiroshima that secondary radiation, causing sterilization and a form of leukemia to anyone entering the area, would remain for seventy years.

Professor Einstein shook his head. "I will not discuss that," he declared emphatically.

About the atomic bombs that have played so important a role in bringing about Japan's plea for peace, Professor Einstein said:

"I have done no work on the subject, no work at all. I am interested in the bomb the same as any other person; perhaps a little bit more interested. However, I do not feel justified to say anything about it."

Although he spoke freely about Russia's last-minute entry into the war against Japan, the famous physicist was unwilling to discuss the question for publication.

I asked, "Do you think atomic power will be brought under control quickly so that it can be used for commercial purposes?"

"No," he replied. "It will probably take many years."

Professor Einstein promptly add-

ed, however, that substances other than Uranium 235 might be found, "and probably will be found," to accelerate its use for commercial purposes.

As for the atomic bomb's hastening the fall of Japan, the professor parried, "I believe you will be much better able to answer that question yourself."

Professor Einstein said that he would be willing to make a statement on the atomic bomb if what he might say would be of importance, but added that he was reluctant to discuss it when there was no real reason for doing so. "As a matter of fact," he laughed, "you will do everyone a favor by not writing any story. I don't believe anyone will be interested."

He explained the principles of nuclear energy and did so in a manner simple enough that even I could understand what he was talking about.

Asked if he would be willing to venture an opinion on how far Germany had progressed toward the perfection of the atomic bomb, the professor said, "That has already been discussed, and anything I might add would be of little interest. Besides, I do not like to make an opinion of a matter unless I know the precise facts."

FORUM ON ATOMIC ENERGY

Broadcast Today to Be First of Series at Princeton

Princeton University scientists who helped develop the atomic bomb will discuss atomic energy over radio station WPAT of Paterson, N. J., today at 2 P. M., when Princeton will begin a series of weekly broadcasts. The series, titled "The Princeton University Preceptorial of the Air," will consist of forum discussions of present current topics by Princeton professors.

Participating in the initial program will be Prof. Hugh S. Taylor, dean of the Princeton Graduate School and chairman of the Chemistry Department; Prof. Henry DeW. Smyth, chairman of the Department of Physics, and Prof. N. Howell Furman, chemist. The moderator will be Prof. Roy Dickerson Welch, chairman of the music section.

ARNOLD PUTS BONG ABOVE ATOMIC BOMB

WASHINGTON, Aug. 11 (AP)—Gen. H. H. Arnold, in a tribute to the late Maj. Richard I. Bong, said tonight that what the men of the air force have done means more to mankind than any scientific development such as the atomic bomb. "This, I firmly believe, will be the verdict of history," the air forces chief said in a statement prepared for broadcast over the NBC network.

Major Bong, leading American ace, died in the crash of a jet-propelled fighter plane last Monday near Burbank, Calif.

General Arnold observed that the front pages of newspapers were filled with another "immense and overwhelming event, the use of the first atomic bomb. People read about Bong's death and commented, too bad, it happens to the best of them."

"Outstanding though he was," General Arnold continued, "Dick Bong typified the many thousands of air force men who have died for their country. Giving without stint or reservation was indeed their way of life and of death. What those men and boys have done means more to mankind than any scientific development, however profoundly significant."

FIRST ATOMIC BOMB ALREADY OBSOLETE

Nagasaki Missile Found More Potent Than One That Tore Up Hiroshima 3 Days Earlier

A B-29 BASE, in the Marianas, Aug. 11 (U.P.)—A new type of atomic bomb, which blew 30 per cent of Nagasaki from the map on Thursday, made obsolete the first one, dropped on Hiroshima three days earlier, it was disclosed today.

Technicians at this secret base are assembling more of history's most destructive weapons for further "disintegration" assaults on Japan in the event current surrender negotiations fail.

The bomb that struck Nagasaki, second city hit by atomic force, was dropped from the Superfortress Great Artiste, commanded by Maj. Charles W. Sweeney of North Quincy, Mass. The men in that B-29 had ridden over the Honshu arsenal city of Hiroshima in an observation plane Monday and watched results of the first atomic attack by the Enola Gay, piloted by Lieut. Col. Paul W. Tibbets Jr. of Miami, Fla.

In their first interview today they said that though they had been forewarned what to expect, results of the Nagasaki attack still were beyond "possible belief."

The crew disclosed that had it not been for bad weather, thousands of Japanese in Nagasaki, a city of 252,630 in northwestern Kyushu, might still be alive today. The plane made three runs over another unidentified city originally scheduled for attack, but bad weather prevented the assault and Nagasaki was selected as a secondary target.

The loss of gasoline spent in maneuvering over the first city made it necessary for Major Sweeney to make an emergency landing on Okinawa instead of flying back to the Marianas.

Brig. Gen. Thomas Farrell of Albany, N. Y., chief of the Marianas atomic bomb project, said that "The function of the bomb used against Nagasaki made the one used against Hiroshima obsolete. The one type used against Hiroshima was discarded in favor of the Nagasaki type."

He added that his men were going on the assumption that the atom bomb might have to be used again and that hundreds of technicians here were assembling parts.

Officials said that they believed that Major Sweeney's bomb scored a direct hit in the heart of the great Mitsubishi steel works in Nagasaki and that the resultant blast erased most of the city. Observers said that debris from the steel plant soared in a thick column of smoke.

[An official announcement from United States Army Strategic Air Forces headquarters had said that almost a square mile of Nagasaki's built-up area of 3.3 square miles had been destroyed.]

It was disclosed that crews of the planes had been trained for a year without knowing the nature of their mission.

Major Sweeney said that the Hiroshima blow was perfect but that Nagasaki was hit under bad conditions. The crew had been ordered to release the bomb visually. After fifty minutes of maneuvering over the original target, Major Sweeney asked Comdr. Frederick L. Ashworth of Wenham, Mass., naval ordnance observer in charge of the bomb, what to do. He suggested trying Nagasaki. Major Sweeney decided that there was just enough "gas" to permit that.

The navigator, Capt. James F. Van Pelt Jr. of Oak Hill, W. Va., hit Nagasaki "on the nose" and there was just enough fuel left for a single bomb run and back to Okinawa. Just as the city was reached, the bombardier, Capt. Kermit K. Beahan of Houston, Tex., saw a hole in the clouds and let fly square on the target.

Sgt. Raymond C. Gallagher of Chicago, wearing welders' goggles to protect his eyes from the bomb flash, said that he could see three "shock circles" rising through the smoke, flames and dust.

ATOMS BURST IN AIR TO CUT LOSS OF LIFE

Blast Above Ground Sharpest Against Buildings but Cloud Sucks Up Radioactivity

Special to THE NEW YORK TIMES.

WASHINGTON, Aug. 11—Even before the test atomic bomb was exploded in the wastelands of New Mexico last month it was foreseen as a weapon of war "potentially destructive beyond the wildest nightmares of the imagination" and "so ideally suited to sudden unannounced attack that a country's major cities might be destroyed overnight by an ostensibly friendly power."

This statement was made, the War Department revealed today, by Prof. H. D. Smyth, chairman of the Department of Physics of Princeton University and consultant to the mysterious "Manhattan Engineering District," where the bomb was developed. The Department made public a voluminous technical study by Professor Smyth, written at the request of Maj. Gen. Leslie R. Groves, head of the project.

Obviously in connection with the assertion of Dr. Harold Jacobson, later corrected, the Department said that there was virtually no radioactivity left in the wake of the bomb and disclosed also that the weapon was fired high enough above the ground to shatter buildings.

Buildings Primary Object

"The bomb," the Department said in the summary, "is detonated in combat at such a height above the ground as to give the maximum blast effect against structures and to disseminate the radioactive products as a cloud.

On account of the height of the explosion practically all the radioactive products are carried upward in an ascending column of hot air and dispersed harmlessly over a wide area. Even in the New Mexico test, where the height of explosion was necessarily low, only a very small fraction of the radioactivity was deposited immediately below the bomb."

The following paragraph was added in mimeographed form:

"The best interests of the United States require the utmost cooperation by all concerned in keeping secret now and for all time in the future all scientific and technical information not given in this report or other official releases."

Professor Smyth's intensive report was written for the scientist, and not the layman. General Groves called it a "fascinating but

Harold Agnew of Denver, Col., a physicist aboard the plane, said that debris from the steel plant boiled up in a column of smoke. He is one of forty-five physicists and aides who were sent to this base last month to assemble the bombs. They had worked secretly in the United States for three years.

Immense laboratories have been set up here. Teams of physicists test materials and assemble these bombs. The base was set up by Col. E. E. Kirkpatrick.

Revelation that the bomb was in action at last was a welcome relief for the physicists. Many of them now find it hard to use the words "atomic" or "uranium," because for three years they had been using code names.

They also said that they would be glad to be able to go home and explain why they were not in uniform. Most of them average about 27 years of age.

Easier to Assemble

GUAM, Sunday, Aug. 12 (P)—General Farrell declared yesterday that the bomb that struck Nagasaki packed more punch than the one dropped on Hiroshima. He added that the second bomb was less difficult to construct.

Major Sweeney said: "The turbulence from the blast at Nagasaki was greater than at Hiroshima."



Gen. Carl A. Spaatz, commander of the United States Army Strategic Air Forces, pinning the Distinguished Service Cross on Col. Paul W. Tibbets Jr., pilot of the B-29 that dropped the explosive on Hiroshima.

Associated Press Wirephoto (Strategic Air Forces via Navy Radiophoto)

highly technical account of an enormous enterprise."

Professor Smyth explained: "The average citizen cannot be expected to understand clearly how

an atomic bomb is constructed or how it works, but there is in this country a substantial group of engineers and scientific men who can understand such things and who

not develop and use this weapon effectively."

Even in advance of the detonation Professor Smyth wrote that the possibilities of such explosives were "appalling," and their effect on future wars and international affairs of fundamental importance.

Professor Smyth considered that such questions as the development of the bomb should be decided by the people of this country. "They have been seriously considered," he said, "by all concerned and vigorously debated among the scientists, and the conclusions reached have been passed along to the highest authorities. These questions are not technical questions; they are political and social questions, and the answers given to them may affect all mankind for generations.

"In thinking about them the

can explain the potentialities of atomic bombs to their fellow citizens. The present is written for this professional group."

"The weapon," the professor continued, "has been created not by the devilish inspiration of some warped genius but by the arduous labor of thousands of normal men and women working for the safety of their country.

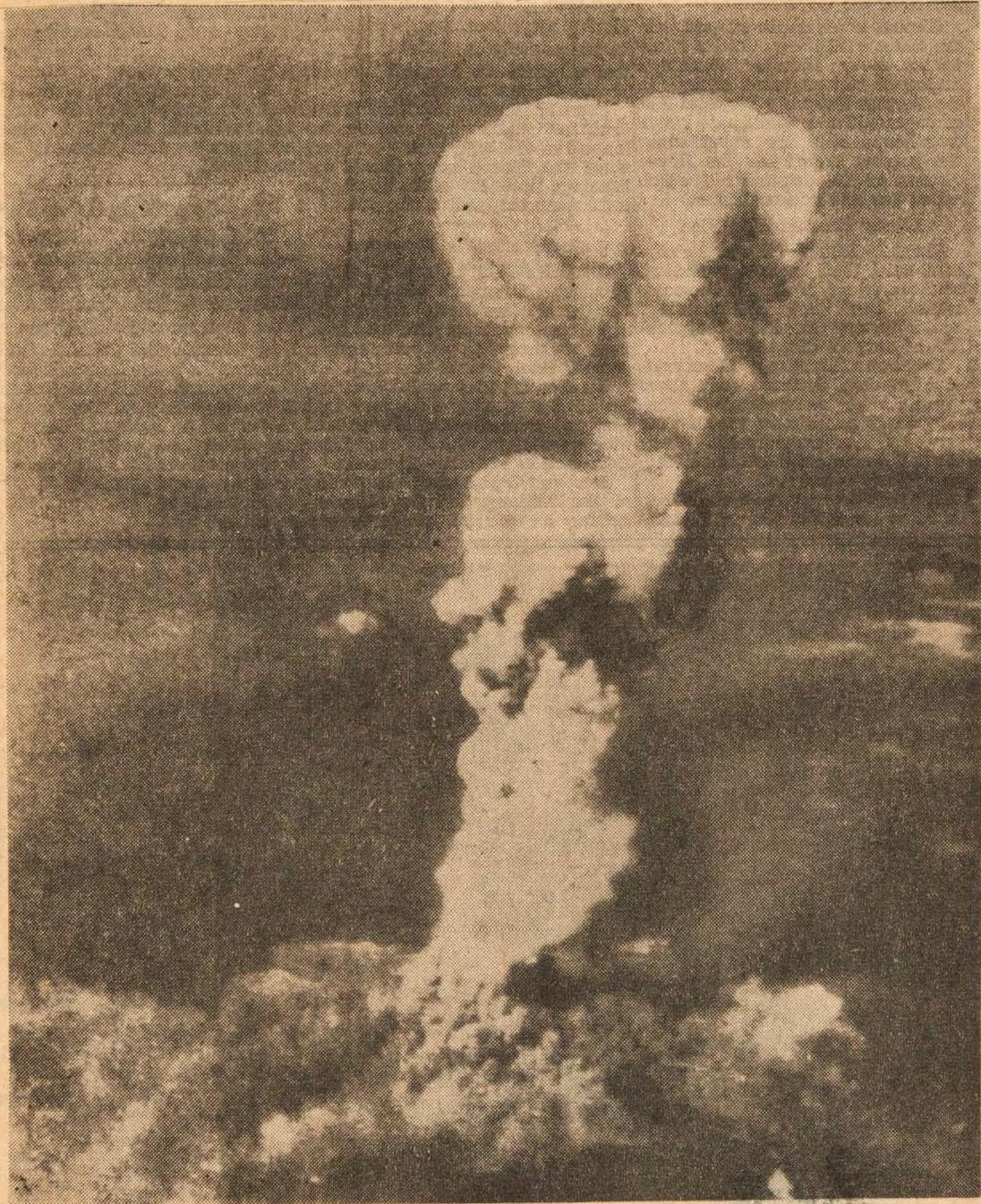
"Before the surrender of Germany there was always a chance that German scientists and engineers might be developing atomic bombs which would be sufficiently effective to alter the course of the war. There was therefore no choice but to work on them in this country.

"Initially many scientists could and did hope that some principle would emerge which would prove that atomic bombs were inherently impossible. This hope has faded gradually; fortunately in the same period the magnitude of the necessary industrial effort has been demonstrated so that the fear of German success weakened even before the end came.

"By the same token, most of us are certain that the Japanese can-

men on the project have been thinking as citizens of the United States vitally interested in the welfare of the human race. It has been their duty and that of the responsible high Government officials who were informed to look beyond the limits of the present war and its weapons to the ultimate implications of these discoveries. This was a heavy responsibility.

"In a free country like ours such questions should be debated by the people and decisions must be made by the people through their representatives."



At Hiroshima: A tall column of smoke ascends 20,000 feet over the city after the first bomb fell on Aug. 6. A cloud of smoke 10,000 feet in diameter covers the base of the column. This picture was made after the missile was loosed from an altitude of between 20,000 and 30,000 feet.

The New York Times (U. S. Army Air Forces)

POPE WARNED IN 1943 ON ATOMIC BOMB USE

ROME, Aug. 11 (UP)—Pope Pius XII more than two years ago forecast the development of atomic energy and broadcast in exact detail the atomic bomb's scientific principle. The Pontiff's address on Feb. 21, 1943, at the opening session of the Pontifical Academy of Science emphasized the danger to the entire planet of any misuse of the atomic energy principle. The speech indicated the Pope was abreast of atomic knowledge two years ago.

While hundreds of Allied scientists and technicians were working in utmost secrecy in the United States, and the word uranium was unmentionable, the Pope broadcast to the world:

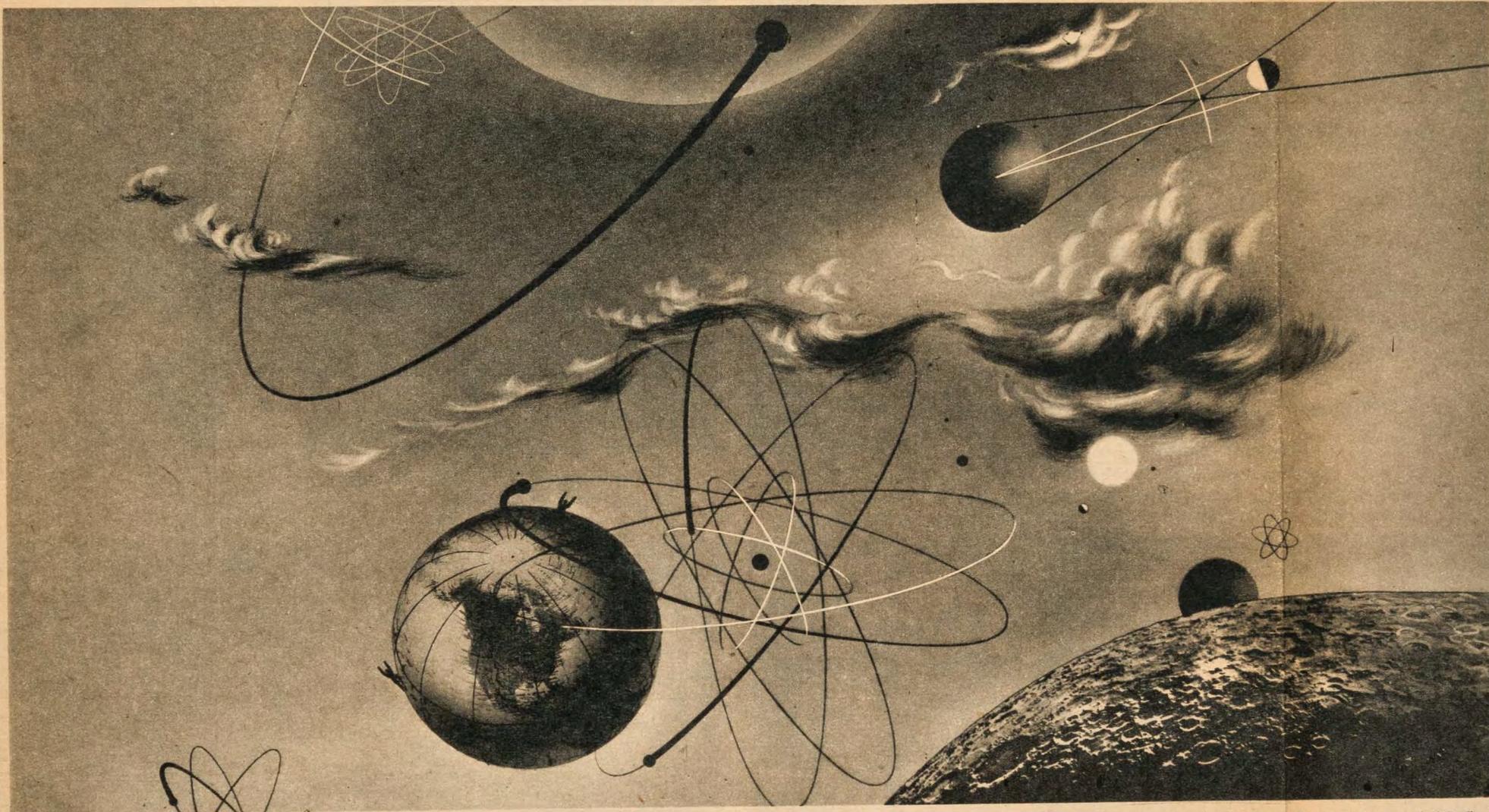
"Since atoms are extremely small it was not thought seriously that they might also acquire practical importance. Today instead such a question has taken on unexpected form following the results of artificial radio activity. It was, in fact, established that in the disintegration which the atom of uranium undergoes when bombarded by neutrons that two or three neutrons are freed, each launching itself—one being able to meet and smash another uranium atom.

"From special calculation it has been ascertained that in such a way [neutron bombardment causing a breakdown in the uranium atom, in one cubic meter of oxide power of uranium, in less than one-hundredth of a second, there develops enough energy to elevate more than sixteen miles a weight of a billion tons; a sum of energy which could substitute for many years the action of all the great power plants of the world."

Then came the papal warning against possible misuse of atomic energy: "Above all, therefore, it should be of utmost importance that the energy originated by such a machine should not be let loose to explode—but a way found to control such power with suitable chemical means. Otherwise there could result not only in a single place but also for our entire planet a dangerous catastrophe."



At Nagasaki: Three minutes after the atomic bomb was dropped on this city on Aug. 9, smoke columns rose more than 20,000 feet above the metropolis. The New York Times (Strategic Air Forces via Navy Radiophoto)



Drawing by Herbert Bayer. © General Electric Co.

"In the world around us, atomic energy is working on a tremendous scale."

We Enter a New Era—the Atomic Age

THE power of the atom has been unleashed. For better or for worse we have entered upon a new era in the history of mankind. The dreams and speculations that have been with us since the Curies discovered the amazing radioactive powers of the atom have become stern reality in the proving grounds of New Mexico and the streets of Japan.

The development is of Promethean significance. Generations millenniums hence may look back upon these years when atomic energy was first put to work in the same spirit in which we now think of the less well documented occasion when man first learned the use of fire.

Fire is a terrible destroyer, and so, today, is atomic energy. But fire is also the basis of the industrial civilization we now know—fire controlled in the boilers of our power plants, in the furnaces of our steel mills and smelters, in our automobile engines and in our jet-propelled and propeller-driven aircraft. The energy within the atom may well be the basis of an entirely new kind of civilization.

SECRETS OF THE ATOM

WHAT has been done with atomic bombs, and the future prospect of useful atomic power, depends upon the knowledge of the atom's interior that has been gained in the last half century. The government-sponsored "Manhattan project" may have cast new light on the very nature of the atom; however, even with

Here is the momentous story of the atom whose energy science has now unleashed.

By **HARRY M. DAVIS**

the 1940 model atom as it was publicly known before atomic physics became a military secret, we can form a pretty workable idea of what atoms are, what constitutes them and where their tremendous energy comes from.

In the first place, atoms are not rare animals. They are everywhere, since every substance in existence is simply an aggregation of atoms, in extraordinary quantities.

Individual atoms are very small. An ounce of uranium, made of one of the heaviest kinds of atom, contains approximately 100,000,000,000,000,000,000 of them. Hydrogen, with the lightest atom, runs about 20,000,000,000,000,000,000,000 to the ounce. To avoid wasting paper with so many zeros, physicists, some years ago, decided to designate the atomic weight of hydrogen as 1 (strictly speaking, this was later modified to 1.008, but that is a rather technical matter). On this scale helium has an atomic weight of 4, oxygen 16, lead about 207 and a particular variety of uranium of current interest has an atomic weight of 235 and is therefore popularly known as U-235.

Small as the atom may be, it is composed of particles which are very much smaller. The simplest of all atoms, hydrogen, consists mostly of empty space sparsely tenanted by only two particles. One of them is the electron, the smallest unit of negative electricity. The other is the proton, with an equal charge of positive electricity. Almost all the mass of the atom resides in the proton, which weighs about 1,800 times as much as the electron. A heavy object is generally less mobile than a light one and the simplified picture of the hydrogen atom is one with the proton constituting a more or less stationary nucleus while the electron circles around it somewhat as the earth circles around the sun. In fact, scientists at one time took the analogy to astronomy so seriously that they borrowed the word "orbit" and we speak of the orbit of the electron in the atomic system.

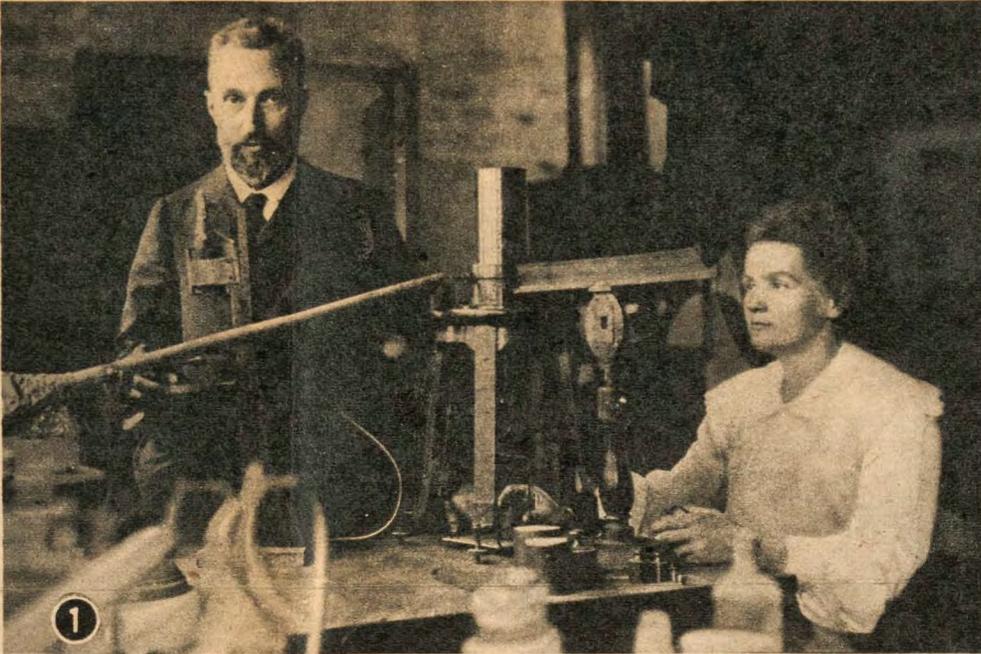
THE minute we leave the simple hydrogen atom, we find that the nucleus gets more complicated. The next step is heavy hydrogen, which has a nucleus consisting of two particles. One is the same proton we found in ordinary hydrogen.

The other is a particle called the neutron, which seems to be identical with the proton except that, as its name was meant to indicate, it is electrically neutral.

Heavier atoms, going up the scale through magnesium, oxygen, iron, lead and uranium, have more and more protons and neutrons in the nucleus, but in every case the positive electrical charge of the nucleus due to its protons is normally balanced by the negative charge of an equal number of electrons circling around it. When in the course of atomic events the number of electrons fails to match the positive charge of the nucleus, the atom is said to be positively, or negatively, electrified.

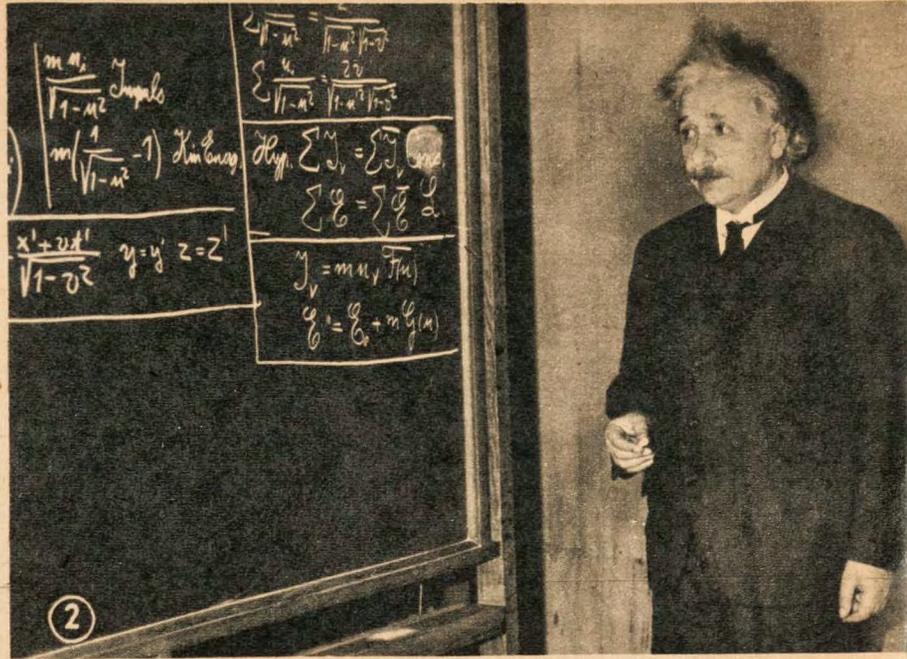
IN a superficial way, men have been tinkering with atoms for thousands of years. For instance, when a piece of glass was rubbed with a silk cloth both the glass and the silk demonstrated properties of attraction and repulsion which were called electrical. What happened, we now know, was that electrons were added to the atoms of one substance and subtracted from the atoms of the other. In modern times it has been found that electrons can be removed from the outside of the atom fairly easily by the action of light, heat and electrical forces, and it is with electrons thus removed from their natural habitat that the entire art of electronics is concerned. Our ability thus to liberate (Continued on Page 41)

The Dramatic Story of the Atom—



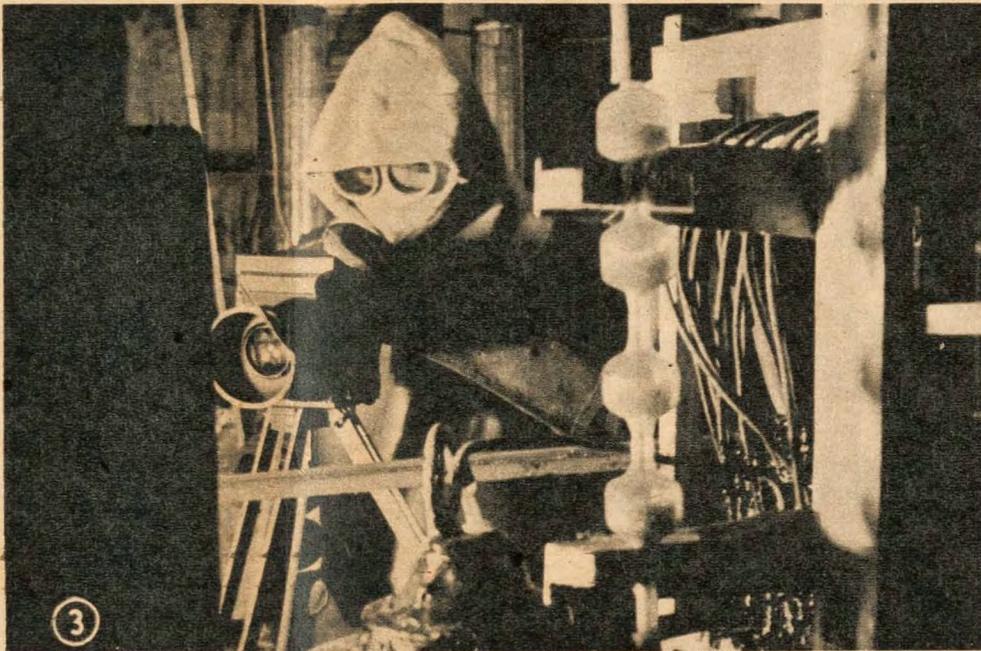
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The story of the atom bomb goes back to the discovery of radium. The research of the Curies, shown above, brought knowledge of radioactive substances, which was used in turn to explore the secrets locked in the atom.



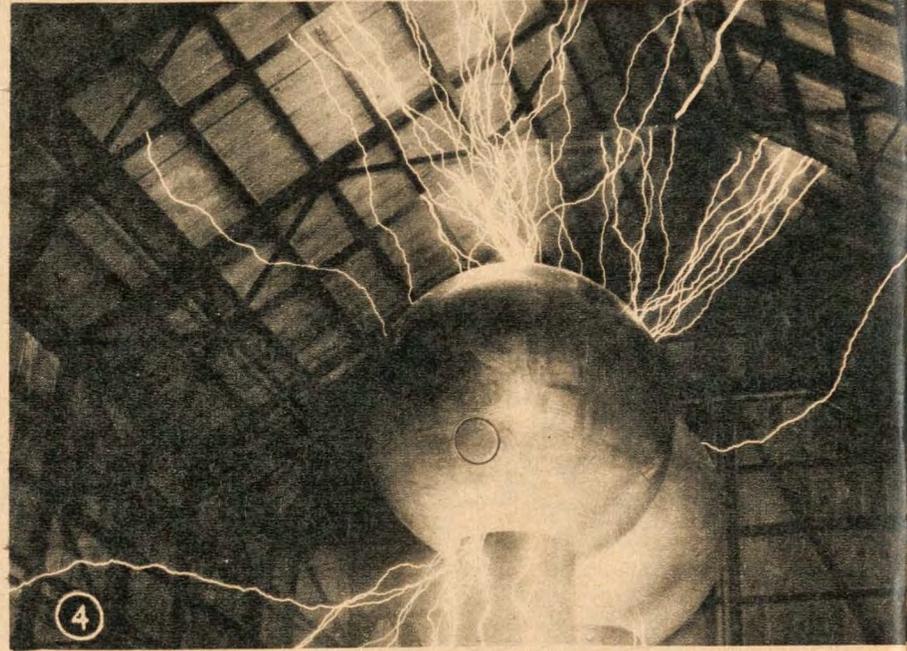
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Einstein made a contribution too. He formulated an equation that showed the relation between energy and matter. His theory indicated that a very small amount of matter could be converted into an immense quantity of energy.



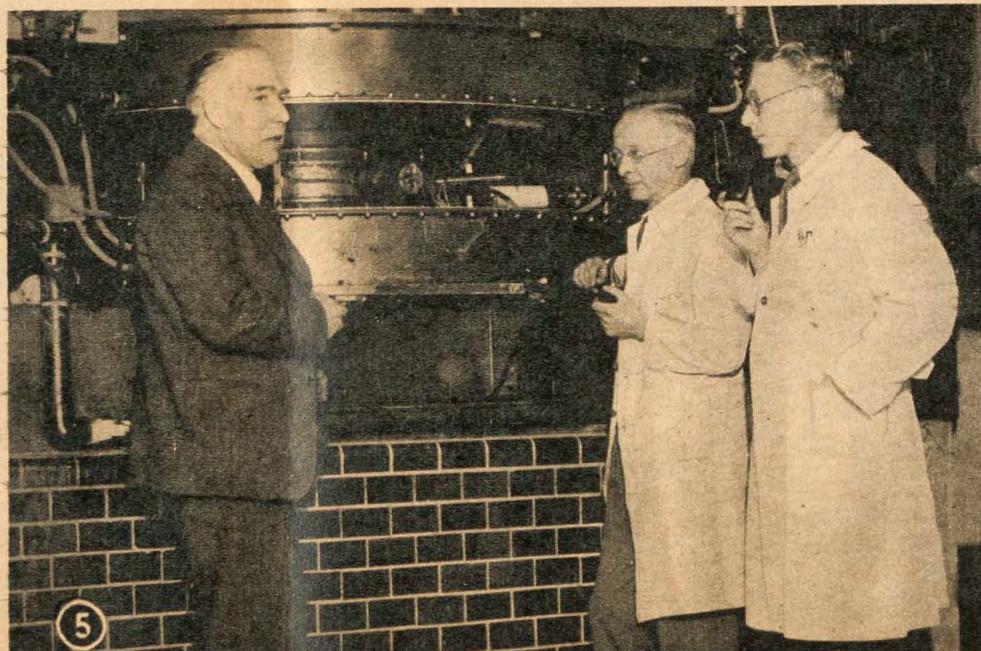
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First attempts to break into the atom were with radioactive substances because they alone had sufficient power. The operator shown photographing the process wears lead-lined clothing to protect himself from these rays.



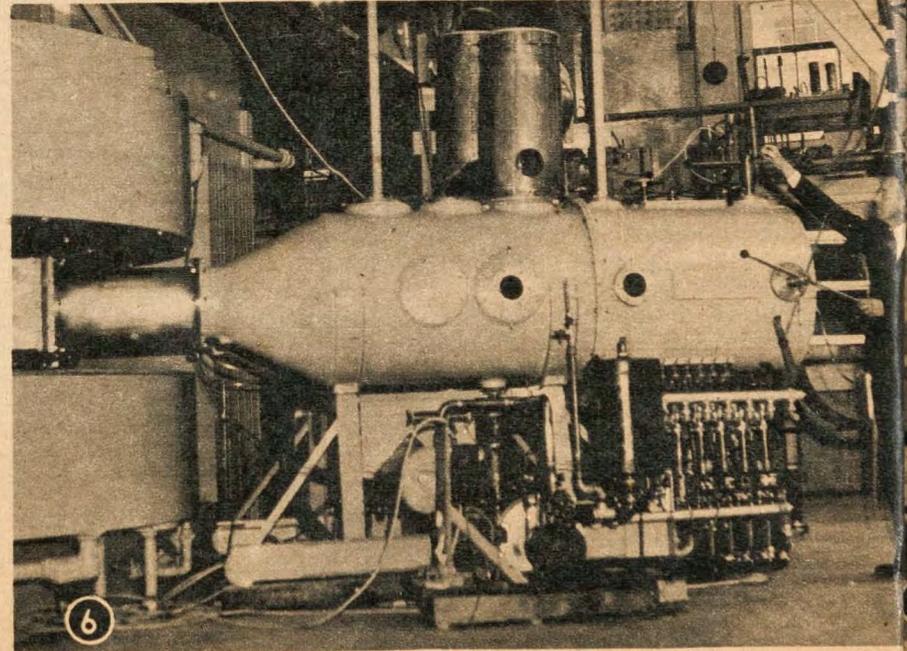
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Next, tremendous electrical energy was employed in the assault on the atom. This early machine had a potential of 7,000,000 volts. But the difficulty was that far more energy was used in the attack than was released by the atom.



5

Men had to know more about how the atom was put together to help them take it apart. Niels Bohr (left) formulated a theory of atom structure, and later defined the chemical character of U-235, a powerful source of atomic energy.



6

This most powerful of all atom-smashing machines, the cyclotron, was invented by Dr. E. O. Lawrence, shown here at the machine. He, like Dr. Bohr, has been a leader in the research project that has produced the atom bomb.

From Radium to the Atomic Bomb

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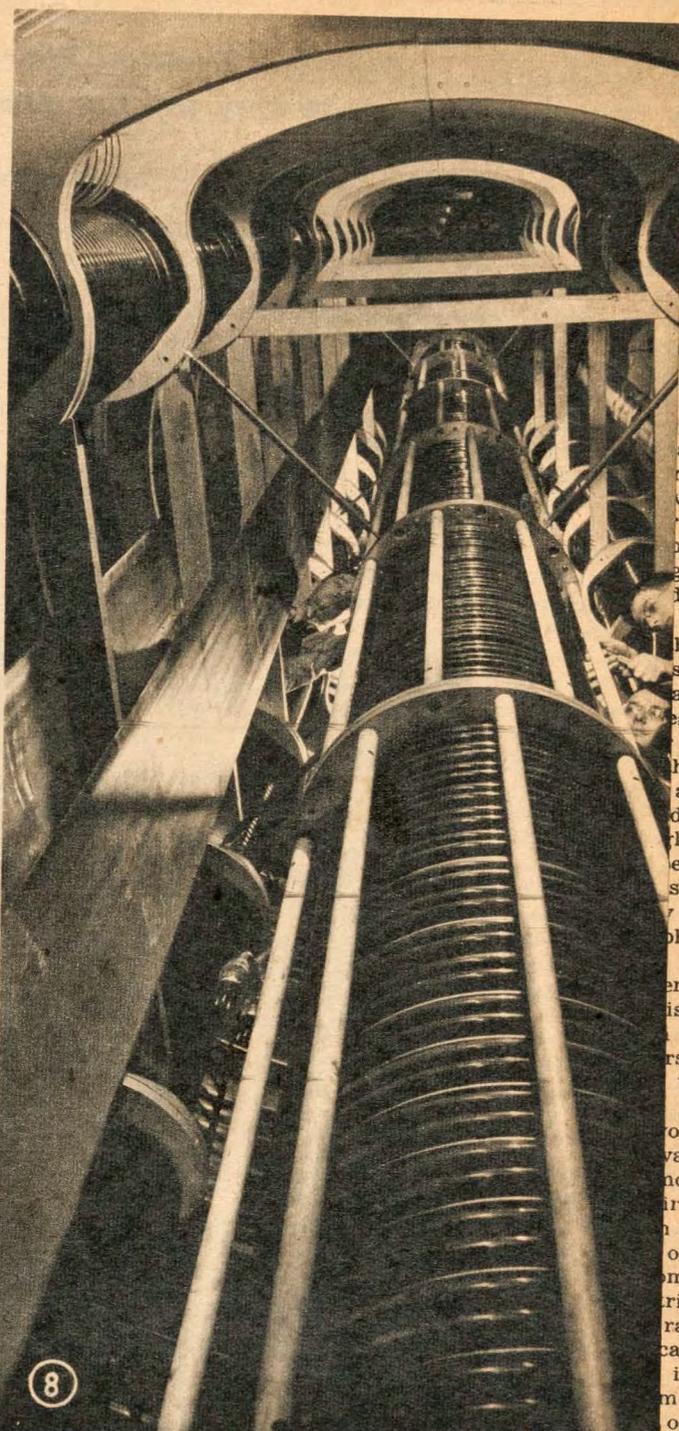
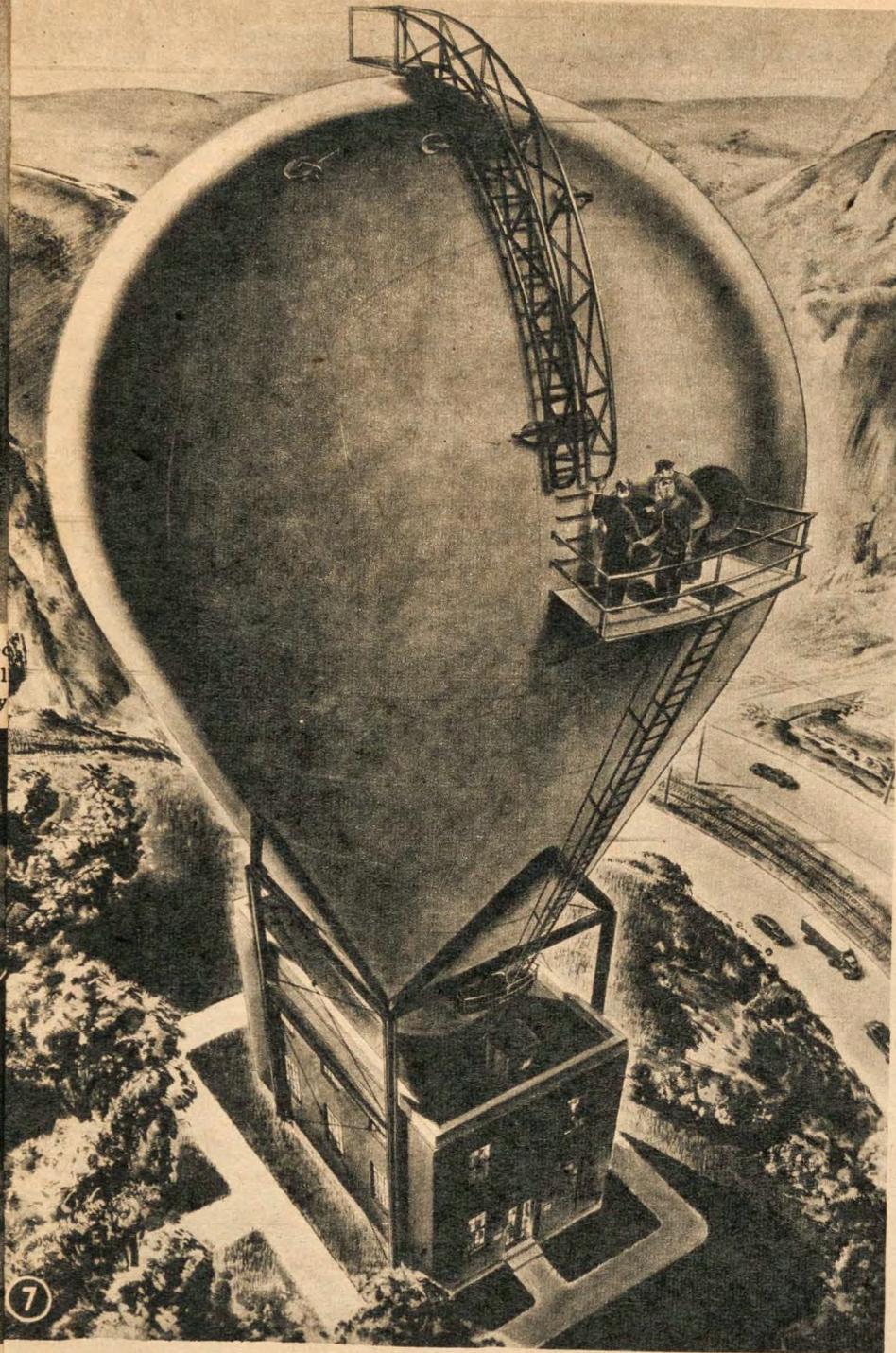
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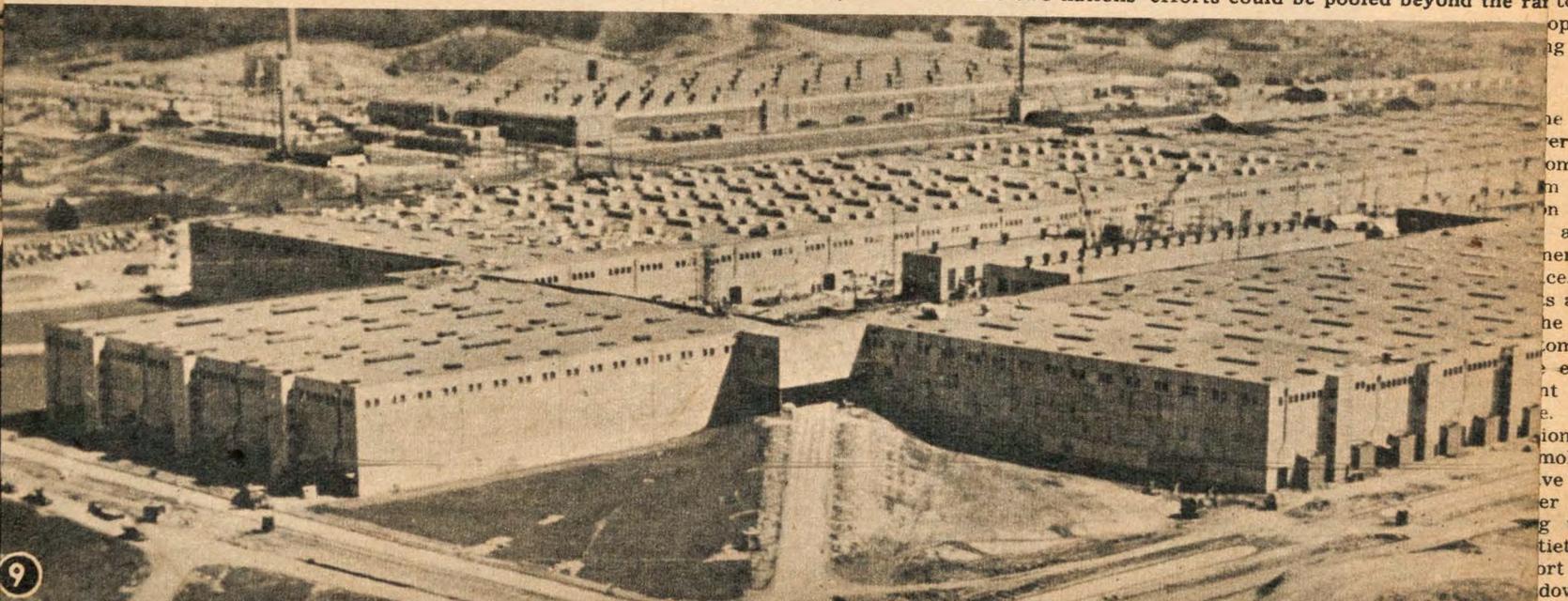
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7 Atom smashers such as the high voltage machines shown above were the source of continuing new discoveries that brought the atom bomb nearer. With the war, research looking toward the bomb became a "top secret" matter and

8 enlisted the energies of many outstanding scientists. British scientists came to this country and joined in the the two nations' efforts could be pooled beyond the rar



9 Finally the atom bomb was ready for production. This great factory at Oak Ridge, Tenn., is but one of the plants used in the manufacture. The processes carried out within its windowless walls remain "top secret." What has been

told is that somehow a way has been found to use Uranium whose atoms take less of a shove to bre the bomb, the atoms of this substance turn from

Ernest Bevin: A New Kind of Statesman

LONDON (By Wireless).

BRITAIN has never had a Foreign Secretary like Ernest Bevin. His appointment breaks all the traditions of the office. He did not go to a public school; he did not go to a university. It is justifiably accurate to surmise that every previous holder of the position has entered the depressingly austere portals of the Foreign Office for the first time with veneration for its tradition and awe for the memory of his illustrious predecessors. Not Ernest Bevin.

He did not want the job. When he was Minister of Labor, the man who mobilized Britain's manpower for war, he said: "When this victory is complete it is my department [of labor] which will restore your personal liberties as workers. And I want to stay there until it is through, if I can, for that one reason. I want no higher office or other place. Having put my hand to the plow, I do not want to turn back or shift anywhere else because, at the end, it will be this department that will deal with the International Labor Office."

Of course, that was during the war, when it seemed possible that the all-party National Government would continue to see Britain through her transitional troubles. It was said long before the elections which swept Labor back to power.

When the elections came and before the results were known, Ernest Bevin said openly and frequently that he intended to become Labor's Chancellor of the Exchequer because of the influence that post has on the nation's economic life.

The factor which led Clement R. Attlee as Prime Minister to select Ernest Bevin for the Foreign Secretaryship was largely psychological. It was the accident of the suspended Big Three conferences in Potsdam. If that conference had ended or had not started, Ernest Bevin would have had his wish and gone to the Treasury. But the fact that President Truman and Generalissimo Stalin with their Foreign Ministers and advisers were waiting in Potsdam led Attlee and his advisers to pitchfork their "strong man," Bevin, into the post and the conference to which he traveled in the first airplane journey of his life.

NO group was more disturbed by the appointment than the higher permanent officials at the Foreign Office and career diplomats all over the world, for no man has said more than Ernest Bevin about the necessity for reforming, modernizing and broadening the outlook of Britain's select patrician diplomatic service. And what he says and writes he does when opportunity offers.

He is going to introduce a labor department into the Foreign Office. He says the "object of that liaison is in future to get the whole of the diplomatic service to move and have their being in a new environment; to recognize that the limited court-circular society of the chancelleries will never return; that, if there is to be reconstruction of the world, then that reconstruction has to be brought about by harnessing and utilizing the rising mass of labor to whom the future really belongs, and which must be the dominant factor in a new democratic world. There must be an absolute broadening of the curriculum and of the right of entry into the diplomatic service. If boys from secondary school can save us in Spitfires the same brains can be turned to produce the new world."

These are heart-sinking words to the

Britain's Foreign Secretary is a St. George out to slay the dragon of secret diplomacy.

By TREVOR EVANS

types who have always administered Britain's foreign policy. Many another man could utter them and be dismissed as a hot-air merchant. Not Ernest Bevin, who has taught Britain in the last five years that he is no shirker from innovations. After all, he uprooted millions of men and women from their homes and conscripted them for mines, factories and forces.

IT is not that Bevin was unknown before he first took ministerial office in May, 1940, even though he was not then a member of Parliament, having failed thrice to secure election. His name has been known

in Britain for twenty years as the somewhat truculent and all-powerful leader of an amalgamation of trade unions concerned mainly with transport, docks, flour mills, steel works, chemical plants, engineering works and a dozen other industries. About the only major industry he did not invade was coal mining. Yet the American labor leader most akin to Ernest Bevin happens to be John L. Lewis.

Bevin reached national prominence in 1919 when he became known as "the dockers K. C." (King's Counsel, a rank of eminence given to lawyers) because of his spectacular presentation of a claim for

increased wages for dockers. He entered court on that occasion in a brown paper parcel under his arm. He asked Bevin to open his parcel and on that occasion he produced a tiny bottle of bread, a slice of meat, a slice of meat and other oddments, and he asked the court that the dockers should have only such paltry fare for the

THE boldness of his approachiveness in bringing abstract questions of wage rates down to concrete terms gained him great prominence at that time because he had recently been transferred to Bristol, where he had spent such odd jobs as driving motor cabs, driving (Continued on



Ernest Bevin—"He carries his 240 pounds with a rolling gait that suggests a galleon in full sail."

We Enter the Atomic Age

(Continued from Page 5)

and control the movements of electrons lifted from the outer shells of atoms is employed in the vacuum and gaseous tubes that are at the heart of radio, radar and many industrial processes. But all this merely scratched the surface of the atom.

IN the laboratories a deeper search was carried into the very interior of the atom—the nucleus. The secret of the nucleus became known to man because nature betrayed it in the phenomenon of radioactivity. The first betrayal took place nearly fifty years ago with the very element that assumed such significance last week—uranium. In 1896, Henri Becquerel, at the Sorbonne in France, happened to place a uranium preparation in the same desk drawer with some photographic plates. When he came to use those plates he found that, although they had been carefully wrapped in thick black paper, they were fogged as if they had been exposed to light. Instead of merely worrying about the spoiling of some photographs, he proceeded deliberately to ruin some more plates by placing them again close to the uranium, but this time with an iron key in between. The result, on development, was a silhouette of the key. Here was a new kind of ray which would penetrate through paper but not through iron.

Two other French scientists, Pierre and Marie Curie, found that in the pitchblende ore of uranium there were other substances which also gave off strange new kinds of radiation. The tremendous power of the radium finally isolated by Madame Curie was shown by the prices which tiny quantities of it later commanded for both hospital and industrial use.

In the ensuing years, many other types of radioactive elements were discovered. These elements—such as uranium and radium—consist of heavy atoms which seem to be naturally unstable. They disintegrate at various rates. In a quantity of a given radioactive element, a certain fixed proportion of the atoms simply explodes over a certain period of time. The nucleus shoots out a particle or a bit of energy known as a gamma ray. There remains a smaller nucleus—that of an atom of lower atomic weight. In most cases, the new atom is itself unstable and therefore radioactive, giving off other particles. These explosions occur in a series which terminates in the form of lead.

THE rays thus given out are powerful. They have power, as Becquerel originally found, to penetrate through solid substances and to blacken a photographic plate. They have power to destroy human flesh, but fortunately the effect is stronger on cancerous than on normal tissue—a phenomenon which made radium so precious as an instrument of medicine. The rays have still another power—to smash into the nucleus of stable

atoms and turn them into unstable and therefore radioactive substances. In other words, with certain combinations, radioactivity becomes contagious. The discovery of this contagion was the beginning of atom-smashing.

AS early as 1905, Einstein wrote a classically simple little equation which really explained a good deal of what was going on. It was part of the theory of relativity, and it indicated two things—that light, which is a form of energy, has mass just as does a particle of matter and that, conversely, any particle of matter can be considered as a bundle of energy. The startling thing about his equation was the factor by which one had to multiply mass to figure out its equivalent in energy. This factor was the square of the velocity of light, that is, 300,000,000 meters per second multiplied by itself. The conclusion, which at first seemed to be only of philosophical interest, was that if only a tiny bit of matter should somehow be destroyed, it would be reincarnated as energy in an enormous quantity.

As physicists began to get better concentrations of radioactive materials they found that an actual disappearance of mass was occurring in the disintegration of unstable atoms. By very careful measurements of the particles into which the atoms split, it was found that the sum of the parts was not equal to the original whole. The difference had gone off into energy, represented in the speed of the particles shot out, in their ability to penetrate through sheets of solid matter, to kill cancers, to darken photographic plates and to smash other atoms.

These discoveries were supplemented by artificial instruments, such as the cyclotron, in which sub-atomic particles were whirled around under very high electrical voltage and speeded up to the point where their atom-smashing abilities were considerably increased. It was found that atoms bombarded by these high-speed particles were transformed into other atoms. Thus the combination of natural radioactivity and artificial accelerating machinery was actually doing what the alchemists of old had never succeeded in accomplishing with their magic words.

BUT all these man-controlled processes affecting the nucleus of the atom were on a very tiny scale. The energies of the particles were measured by turning a microscope on the tracks made by them in special photographic plates or by their effect in causing tiny droplets to condense out of foggy vapor. The quantities of gold, radioactive salt and similar products of the newer alchemy were microscopic. And, although atomic energy was definitely released it usually appeared only in a relatively small number of atoms. While an individual atom might show a profit in energy, the over-all

(Continued on Page 42)

We Enter the Atomic Age

(Continued from Page 42)

engine. Yet certain speculations seem plausible. The first step might likely be to capture atomic energy as heat, perhaps using a tiny pellet of the stuff to flash a tremendous amount of water into superheated steam—which could then drive the turbines now in our power plants. In this application uranium would replace both coal and falling water to provide a vastly increased flow of electric power over the high-tension lines of the nation.

IF this were to happen it would probably mean far-reaching changes in the distribution and use of electric power besides reducing coal to a raw material for synthetic compounds, and limiting dam-building projects to the functions of flood control and irrigation.

Then again, and this seems a thing of the more distant future, some more direct way of utilizing atomic energies may be found. Perhaps, for example, a way of channeling the explosive force at once into a jet-thrust providing super-speed propulsion for winged and wingless conveyances. If this can be done, then gravitation might easily be overcome and the day of actual travel beyond our planet would be at hand.

It must be remembered too that atomic science is still in its infancy. The fission of uranium may be only the first of many ways of releasing the known energies within the atom—just as the rubbing of two sticks was only one primitive way of starting the contagious molecular explosions known as fire.

The tasks are such as to mobilize the best brains of humanity for generations to come. Atomic physics with its intricate apparatus, its dangerous radiations of still obscure biological effect on the human system, its baffling equations of quantum mechanics and its basic impact on the problems of the very nature of the universe—this science, far more than the much discussed field of electronics, is likely to challenge an increasing proportion of young men entering our universities.

ACTUALLY the ultimate source of all the power we use today on earth is from the heat radiated to us from the sun—where its generation is atomic. Thus we work on an indirect transformation of energy from a distant atomic furnace. The problem for our scientists and statesmen is to utilize the energy of our own earthly atoms directly without turning the earth itself into an incandescent and uninhabitable ball of fire.

If atomic explosions can be properly tamed, as molecular explosions already have been, the world may well enter a new era in which everything up to the middle of the twentieth century will seem only a short step from the caveman's shadowed home into the sun.

N.Y.T 8/13

ATTLEE ASSURES U.S. OF COOPERATION ON ATOMIC CONTROL

Pledges That Britain Will Help
Guard Bomb's Secret Until
It Can Be Fully Regulated

TO AVERT WORLD HAVOC

A Power for Peace Is Seen
—Industrial Use of Force
Within Decade Predicted

By The Associated Press.

LONDON, Aug. 12—Prime Minister Clement R. Attlee tonight pledged British cooperation with President Truman's proposal that the secret of the atomic bomb be guarded until complete control of the devastating weapon was assured.

The Prime Minister, back at 10 Downing Street after spending Saturday night at his Chequers country place, made this announcement:

"Since I issued the statement on the day of the release of the first atomic bomb a week ago, the vast and terrible effects of this new invention have made themselves felt.

"The last of our enemies has offered to surrender.

"The events of these tremendous days reinforce the words in that statement to the effect that we must pray that the discovery which led to the production of the atomic bomb will be made to conduce to peace among the nations, and that instead of wreaking measureless havoc upon the entire globe, it may become a perennial fountain of world prosperity.

Influence for Peace

"President Truman in his broadcast of Aug. 9 has spoken of the preparation of plans for the future control of this bomb, and of a request to the Congress to cooperate to the end that its production and use may be controlled and that its power may be made an overwhelming influence toward world peace.

"It is the intention of His Majesty's Government to put all their efforts into the promotion of the objects thus foreshadowed and they will lend their full cooperation to that end."

In Bangor, Wales, the National Council of the Independent Labor party, which is not affiliated with the Labor party Government, adopted a resolution declaring that the discovery of the use of atomic energy "could be of the greatest benefit ever vouchsafed to man" in a socialist world.

The resolution said the human race "must go forward to a new order of world socialism if it is to survive." The Independent Labor party has three seats in the new House of Commons.

Industrial Use in Decade Seen

WASHINGTON, Aug. 12 (AP)—Sir James Chadwick, chief British scientist in the atomic bomb project, said today there was a possibility that within about ten years atomic energy could be used for industrial purposes.

The Nobel Prize winner in physics in 1935 also declared that the atomic bomb was not strictly a British-American secret, asserting that any nation could learn the secret in about five years of experimentation, assuming it had access to the necessary raw materials.

"I think this is a very serious point," he said.

Sir James was chief scientific adviser to the British members of the American-British-Canadian policy committee that developed the bomb that wrecked Hiroshima and Nagasaki in Japan.

The work of this committee, he told a press conference, was confined to developing atomic energy for purely military purposes and very little attention was paid to the industrial possibilities. However, he said it would be "nearer

Continued on Page 10, Column 2

ATTLEE WILL HELP KEEP ATOM SECRET

Continued From Page 1

ten years than fifty" before the secret of harnessing this new power for industrial purposes could be found, although there were many new problems to be solved.

He declined to say whether the three plants now producing the atomic bomb in the United States could be used for development of industrial atomic energy.

Meanwhile the United States Chamber of Commerce in its regular weekly report told its members that this new discovery would not immediately revolutionize industry, and that the "early" replacement of present sources of energy—coal, oil, gas and water power—was out of the question. The organization said it had gone into this aspect of the question with other physicists.

Britain Praises Scientists

LONDON, Aug. 12 (U.P.)—The Secretary of the Department of Scientific and Industrial Research, Sir Edward Appleton, paid tribute to British, American, French, Danish, German and Italian scientists and workers whose "sequence of discoveries" led to creation of the bomb.

Emphasizing that scientists were not interested in the bomb's destructive force, he said they were "far more eager to turn to the difficult task of harnessing its energy to benevolent means."

The Very Rev. W. R. Inge, former "Gloomy Dean" of St. Paul's, in an article in The Sunday Dispatch criticized the use of the atom bomb as a "revolting business" that raised "the spectacle of possible suicide of civilization to be followed by a long dark age."

The 86-year-old prelate wrote:

Only U. S. Can Make Deadly Atomic Bomb

By the United Press.

OTTAWA, Aug. 13.—Munitions Minister C. D. Howe revealed today that while the United States, Great Britain and Canada share the scientific knowledge upon which the atomic bomb is based only the United States knows the details of the bomb's manufacture.

Mr. Howe explained that Canada's role in the production of the bomb was to supply "the essential raw materials," leaving it to the United States to devise its manufacture.

"Canada has the right to ask for all the details of manufacture, but so far has not done so," Mr. Howe said.

He said Canada had not w/

"I do not wish to discuss the moral aspect of the obliteration of Japanese towns. Our statesmen and generals are not cruel men; they must answer to their own consciences for what they are doing. There has been nothing like it since Hurlagu and his Tartars built pyramids of skulls on the sites of Baghdad and other Asiatic cities.

The argument that the atom bomb would shorten the war "might be used to justify any violation of the customs of civilized warfare," he said.

Indian Papers Protest

NEW DELHI, India, Aug. 12 (Reuter)—The use of the atomic bomb was condemned by Indian journals today, The Statesman asking whether the conscience of the Allied peoples would stand for the destruction of one Japanese town after another.

"Can these bomb wielders be the Allies who denounced German and Japanese terror in proper and righteous indignation, who fight to free the world from fear and who have assured the Japanese people that there is no wish to destroy and enslave?" the paper queried.

The Hindustan Times, a leading Congress party paper, declared that the Allies could not justify the atomic bomb on any principle of warfare except that of reprisal.

"Now that Russia has entered the war there is no need to purchase victory at such cost to the conscience of humanity," the paper added.

Evatt Sees Peace Body Needed

MELBOURNE, Australia, Aug. 12 (Canadian Press)—Dr. Herbert Evatt, Minister of External Affairs and chief Australian delegate to the San Francisco Conference, said tonight that splitting the atom for purposes of destruction made more urgent than ever the establishment of a world organization for preserving peace.

CANADA DESCRIBES SHARE IN ATOM BOMB

OTTAWA, Aug. 11 (AP)—Canada has taken ownership of the mine and extraction plants at one of the world's two most important deposits of uranium, the primary material in the atomic bomb, to protect the supply for the United Nations, C. D. Howe, Minister of Munitions and Supply and Reconstruction, said tonight.

In a statement released by the Canadian Wartime Information Board, Mr. Howe told of Canada's role in the development of the atomic bomb. Canada, he said, had entered the research into the use of uranium at the suggestion of the British, with whom she established a joint laboratory in Montreal that now has a staff of more than 340.

The work in Montreal, he asserted, led to the design of a pilot plant for production that is under construction in Petawawa, northern Ontario. Under the jurisdiction of Defense Industries, Ltd., the plant is part of a combined British-American-Canadian program.

Research in Petawawa, he said, will include the application of atomic energy in industry and the use of its products in medicine. Another product of the Petawawa plant, the statement said, will be plutonium, a new substance whose atoms, like those of uranium, are capable of bursting many million times more violently than do molecules of modern high explosives.

Radio-Active Poisoning By Reich Once Feared

By Science Service

WASHINGTON, Aug. 12—The disclosure of a hair-raising war danger, now happily passed, that must have given a handful of scientists and top Government officials many sleepless nights appears in technical information about the atomic bomb released by the War Department here.

The possibility that the Germans might have made a surprise use of radio-active poisons in a "particularly vicious form of poison gas" was considered early in the American scientists' atom-splitting experiments. Defensive measures were planned.

Radio-active poisons resulting from atom-splitting were first mentioned in May, 1940, in a report of a committee of the National Academy of Sciences. They develop as the chain reaction of uranium splitting proceeds and have, in practice, turned out to be "the most troublesome feature of a reacting pile." They differ chemically from uranium, so it was believed that it might be possible to extract them and use them "like a particularly vicious form of poison gas."

TURKS CITE ATOMIC BOMB

Istanbul Papers Attribute to It
Japan's Surrender Offer

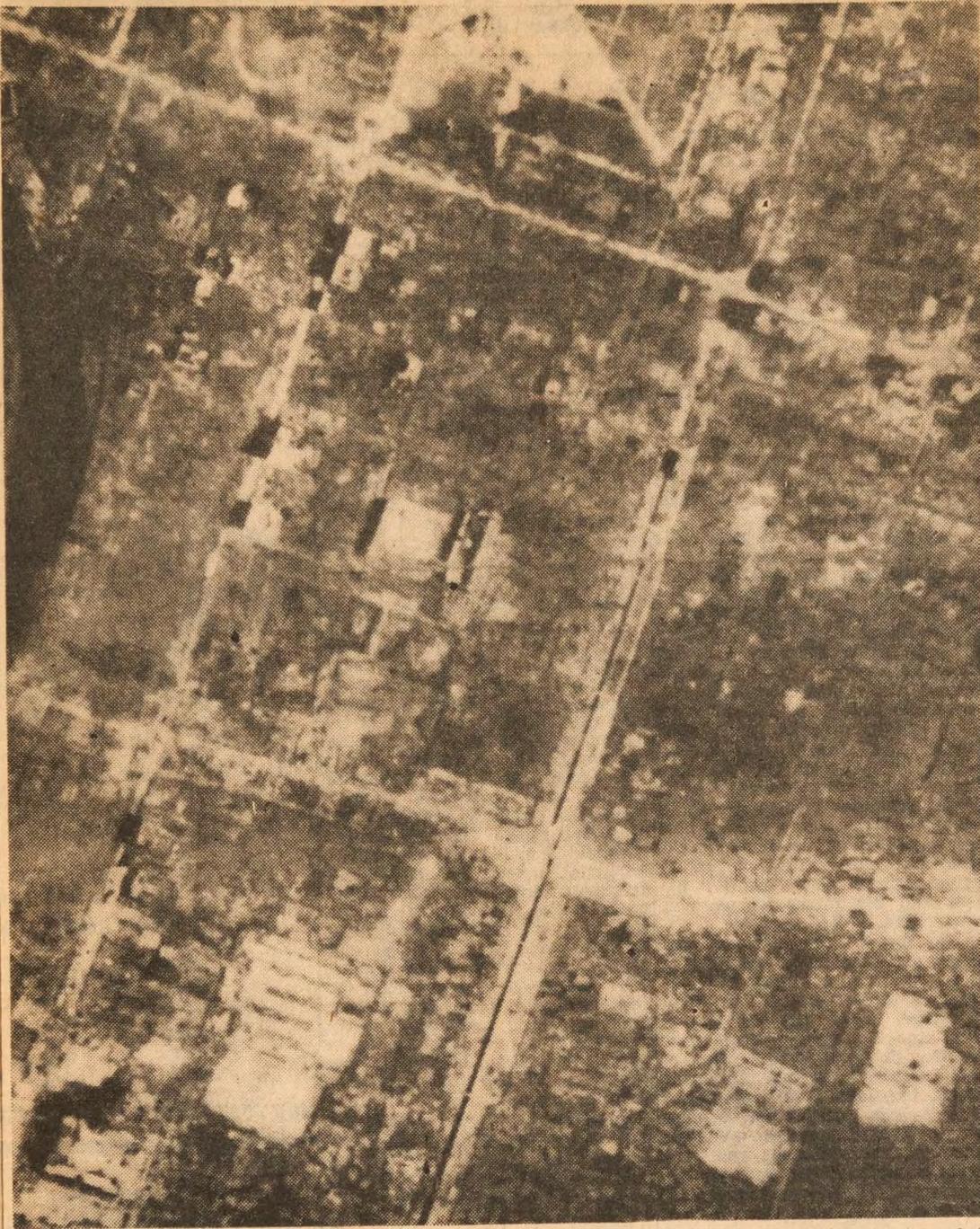
ISTANBUL, Turkey, Aug. 12 (Reuter)—The Turkish press, hailing the news of Japan's offer of surrender, is almost unanimous in attributing to the atomic bomb what it sees as the collapse of Japanese morale.

The democratic Vatan said "it is certain that the participation of Russia in the Far East war was not the chief factor. * * * The atomic bomb was for a people with strong superstitions, Heaven's sign that God had forsaken them."

"The atomic bomb saved mankind, the newspaper Vakit said. The second world war ended with an undeniable triumph for the democracies and for the principles guaranteeing the freedom of men and nations."

With the news of Japan's offer, flags immediately appeared in all the streets and even greater enthusiasm was shown than for Germany's capitulation.

JAPANESE CITY DISAPPEARS AFTER ATOM BOMB EXPLODES



The damage caused by the missile dropped on Hiroshima is revealed in this composite air view of the city on Aug. 7, the day after the attack. For block after block, only an occasional building is standing.

Associated Press Wirephoto (U. S. Army Air Forces)

N.Y.T 8/13 21 |
DuPont Operates Two Atomic Bomb Plants

With the cloak of top secrecy partially lifted from the atomic bomb, E. I. du Pont de Nemours & Co. today revealed how it built and operated a \$350,000,000 plant surrounded by 600 square miles of government-owned or controlled land in the State of Washington.

Reporting to stockholders, W. S. Carpenter Jr., president of du Pont, said that he still could reveal no details of what the company actually manufactured, but he did explain at length the company's contractual relationship with the government.

It was in the fall of 1942 that Maj. Gen. Leslie R. Groves asked du Pont to engineer, design, construct and operate "a large plant" in the field of nuclear physics. At first the executive committee demurred because the company was already so overburdened with war work that few of the committee could see how sufficient personnel could be assigned to the task. Furthermore, the company's work had always been mainly in the field of chemistry and not physics.

However, because of the urgency of the atomic work, du Pont agreed to go ahead and specified two con-

ditions: (1) that there be no profit for du Pont in the operation, and (2) that should any patent rights develop they would become the property of the government and not du Pont. In return the company requested and received an agreement from the government covering the highly unusual conditions of operation.

The government agreed to pay a fixed fee of only one dollar, but to pay all costs of the work by direct reimbursement or through allowances to cover administrative and general expenses allocated to the work in accordance with normal du Pont accounting practices, and to protect the company against all claims and losses. Any portion of these allowances not expended by du Pont will be returned to the government.

As a result of the agreement du Pont designed, engineered and built a small-scale semi-works at the Clinton Engineer Works in Tennessee and built and operated a large-scale plant at the Hanford Engineer Works in the State of Washington.

It was this Hanford plant that

(Continued on Next Page.)

DuPont Reveals Work on Bomb

(Continued from Preceding Page.)

was operated on an unheard-of scale, although, according to Mr. Carpenter, "the Clinton semi-works proved to be an extremely important tool in solution of the many completely new problems encountered at Hanford."

The du Pont company worked closely with the metallurgical laboratory at the University of Chicago, particularly for fundamental research, development and advice, since du Pont was primarily an engineering, industrial and chemical concern.

As an example of the magnitude of the Hanford project, more than 60,000 persons were employed in construction and other phases of development over a two-year period. The housing for these workers alone constituted a gigantic problem. The actual construction force reached a peak of 45,000 persons.

REICH YEAR BEHIND ON ATOMIC BOMB

NYT 8/13
Munich Physicist Relates Work
in Germany—1939 Prediction
on Uranium Weapon Cited

By KATHLEEN McLAUGHLIN

By Wireless to THE NEW YORK TIMES.

MUNICH, Germany, Aug. 12—On the day the war ended in Europe, Germany's production of the atomic bomb still was at least one year from realization. Such, at least, was the estimate by United States Army Air Force officials received yesterday from Dr. Hans A. T. Bomke, a German physicist now living in Munich, who was interrogated on details of the German program because he was associated with experiments in that field in 1939.

As assistant to Prof. Otto Hahn, director of the Kaiser Wilhelm Institute at Dahlen, Dr. Bomke and other scientists were drafted by the Nazis for the development of a high priority program promptly upon the outbreak of war. He was withdrawn by the Hitler regime in 1942 and ordered to work under pressure, he told Air Force questioners, doing research on ultrashort electric waves with the object of bringing Luftwaffe navigation instruments up to the level of progress revealed in captured Allied planes. This was our superiority in radar equipment, Army men commented, that Dr. Bomke and his associates succeeded in large part in equaling after two years of intensive effort.

Background Supplied

Although divorced from intimate contact with the atomic bomb progress after 1942, Dr. Bomke was able to supply the scientific background of the endeavors of Professor Hahn, who now is in the United States, where he reputedly has been taken for comparison of his efforts with those of American scientists in the same category.

No practical application of atomic forces was possible, he related, until 1919, when Lord Rutherford, English physicist and Nobel Prize winner, succeeded in transmuting the chemical elements by artificial means. Professor Hahn at that time was Lord Rutherford's assistant and therefore was familiar with his investigation. The practical use of experiments was held up for years, since a basic requisite was the discovery of nuclear reactions that would provide a continuous chain and thus permit control of atomic forces as a source of energy. This particular gap in scientific understanding was bridged, theoretically at least, by Professor Hahn at the beginning of 1939, Dr. Bomke told the Air Force representatives.

Although Professor Hahn was a pure scientist and uninterested in

practical exploitation of his work, he succeeded in producing a new and unexpected effect that came to be known as uranium fission and that now has become famous in the scientific world through the atom bomb, Dr. Bomke said.

1939 Prediction Cited

About three months later, while working on Professor Hahn's principle, physicists at the Curie Institute in Paris found out further that as a by-product of this fission, new secondary neutrons were produced that made possible the creation of a chain reaction with intra-atomic force. The foundation therefore had been laid for the beginning of tests for the practical utilization of this continuous flow of energy. Emphasis was put on this factor by Dr. Otto Frisch, a former collaborator of Professor Hahn, who had been compelled to emigrate from Germany in 1933 and was working in Denmark.

In 1939 Dr. Frisch wrote an article predicting the future application of Professor Hahn's principle and suggesting that experiments with uranium bombs be performed on a solitary island in the Pacific to reduce the risk of the enormous damage the explosion of such a bomb would cause. Then began a race among the scientists of the world. Important contributions were made during experiments with uranium, in Russia by a Professor Kapitzka, and in Germany by Professor Hahn's associates, Prof. Werner Heisenberg, inventor of modern quantum mechanics, and a Nobel prize winner, and Prof. W. Bothe of the University of Heidelberg.

Then came the war and the strictest secrecy instantly was imposed on this work. Similarly, in the United States, many scientific research institutes became specialists in atomic destruction experiments, and proved eventually to be the first to manufacture successfully the atomic bomb.

NYT 8/14

BOMB-MAKING ROLE PLAYED BY DU PONT

Head of Chemical Enterprise
Tells Stockholders of Vast
Undertaking by Concern

CONTRACT BARRED PROFITS

Company Engineers Assisted
Building on Plants—Chemists
Speeded Atomic Wonder

E. I. du Pont de Nemours & Co., for a dollar fee, helped develop the atomic bomb in a far-flung project costing the Government \$350,000,000, stockholders were informed yesterday in a statement from Walter S. Carpenter Jr., president of the chemical enterprise.

Details of how du Pont undertook the assignment in the fall of 1942, entered the field of nuclear physics and created special plant and research facilities to cope with the task were released with War Department approval.

Specifically, the company was responsible for engineering, designing and constructing a small-scale semi-works at the Clinton Engineer Works in Tennessee and a large-scale plant at the Hanford Engineer Works in Washington. More than 600 square miles owned or controlled by the Government were required for the product. Du Pont also operated the Hanford works.

45,000 on Construction Force

In the midst of the utmost secrecy, plant and housing accommodations were built by a construction force that reached a maximum of 45,000.

Mr. Carpenter revealed that when his company first was approached by the Government because of its experience in developing new processes, executives were reluctant to take on the task in view of heavy war production commitments and the fact that exploratory work had been confined chiefly to the field of chemistry.

However, he explained, when it was pointed out that victory hinged upon solution of the problem involved and that the enemy also was engaged in the race, the company felt it could not refuse to attempt the work.

Two conditions were imposed. The first was that Du Pont was not to profit. The second was that any patent rights developing out of the work should become the property, not of Du Pont, but of the United States Government.

Government Establishes Protectives

In return, Du Pont requested that in view of the unknown field into which it would enter and the unpredictability of the hazards, the Government should provide equally unusual protection against all costs, expenses, claims and losses sustained.

The contract established a fixed fee of \$1, with the Government agreeing to pay all costs by direct reimbursement or through allowances to cover administrative and general expenses. Du Pont renounced patent rights on the ground they should be controlled by the Government.

Because of the fundamental research required, the Clinton semi-works was operated under the direction of the University of Chicago, but key Du Pont personnel was used by the university on a loan basis. The company used the metallurgical laboratory of the University of Chicago for research, consultation and advice.

Mr. Carpenter said it gave him a deep sense of gratitude to report that the "carrying out of this undertaking has been thoroughly sat-

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BOMB-MAKING ROLE PLAYED BY DU PONT

Continued From Page 28

isfactory to the Government." In addition to the major project, several other contributions were made to the atomic program, he added.

ENGINEERING UNDERTAKING

Stone & Webster Says Plans Covered 12 Million Square Feet

Plans and specifications for the larger of two atomic bomb plants at Oak Ridge, Tenn., were drawn up on 12,000,000 square feet of blueprints and whiteprints by hundreds of engineers and draftsmen who worked overtime seven days a week for more than a year, John R. Lotz, chairman of the board of Stone & Webster Engineering Corporation, disclosed yesterday.

The toughest part of the job, which the firm began in December of 1942, he said, was to design and obtain process equipment, much of which was entirely new in concept. At peak production, 27,000 men and women worked on the project. The contract also called for planning and building a city with a population of 75,000.

HUTCHINS DEMANDS WORLD STATE NOW

**Calls for Such an International
Monopoly to Control Atomic
Bomb and Abolish War**

CHICAGO, Aug. 12 (AP)—The atomic bomb "may frighten the peoples of the earth into taking the positive steps necessary to the creation of one world government not a thousand or 500 years hence but now," Dr. Robert M. Hutchins chancellor of the University of Chicago, asserted today.

Speaking on the University of Chicago Round Table broadcast Dr. Hutchins declared, "up to last Monday I was opposed to the idea of a world state because I believed no moral basis for it existed—no world conscience or conviction of the world community sufficient to keep it from disintegrating."

"I do not think we shall be any better off because of the bomb. But the alternatives seem clear. Only through the monopoly of atomic force by a world organization can we hope to abolish war."

Dr. Hutchins added, "all the evidence points to the fact that the use of the atomic bomb was unnecessary; therefore the United States has lost its moral prestige," but, he added, "perhaps the future is more important than the past."

Participating in the discussion were William Fielding Ogburn, Professor of Sociology at the university, and R. G. Gustavson, scientist and vice president of the university.

Professor Ogburn predicted "the development of atomic energy will tend to strengthen big industries and to reinforce movements toward monopoly and cartels."

Remarking that "the atomic bomb is the biggest challenge universities have ever faced," Professor Ogburn stated that "without liberal education and spiritual education and training, it may become our master and our destroyer." Mr. Gustavson maintained that the radioactivity associated with work on atomic force would be important in new studies of disease processes.

National Research Argued

**Dr. Conan Favors Federal Subsidies
But Wants Freedom for Science**

TO THE EDITOR OF THE NEW YORK TIMES:

An editorial in your paper of July 21 comments somewhat adversely on the proposals put forward by Dr. Vannevar Bush in a report to the President of the United States entitled "Science, the Endless Frontier."

The basis of your criticism appears to be that Dr. Bush, in advocating the establishment by Congress of a national research foundation, does not go far enough in providing for planning by the Federal Government. You "doubt if his proposal spells the highest efficiency" and incline toward "the other alternative, to follow the methods of the industrial laboratories where we find organization 'teamwork,' planning and competent direction."

Similar sentiments have been expressed by Dr. Kaempffert in THE NEW YORK TIMES of July 22 in a review of Dr. Bush's report. To Dr. Kaempffert it seems "that Soviet Russia has approached this task more realistically" and that "America needs something more like the OSRD, something more efficient than a body of higher-ups who wait for ideas to be submitted."

Wide Discussion Urged

The issues raised in your editorial and Dr. Kaempffert's article are of so great significance for the future of the country that I hope we shall have widespread discussion of them in the months ahead. There is no disagreement between the authors of the proposals in question and THE TIMES as to the importance of Federal subsidy of scientific research or the need for a new agency with wide powers to expend Federal funds to forward scientific research.

The question turns on the extent to which the new agency shall plan and direct research. Since the OSRD is referred to in both the editorial and the article, and as I have been closely associated with this agency from the start, but had no part in preparing the proposals for the support of research (as apart from scholarships), I may perhaps be permitted to give my testimony for whatever it may be worth.

It is very interesting to find THE TIMES advocating a greater degree of direction and planning by a Federal agency than does Dr. Bush and the committees whose detailed recommendations form the basis for Dr. Bush's proposal. The advance of science is a social phenomenon, as our friends on the left are fond of reminding us; any scheme for spending a large amount of Federal money on scientific research cannot be considered apart from the general political, social and economic framework of the United States of the next few decades.

Question of Goals

While the line of demarcation between pure and applied science is never sharp—we are dealing with a wide continuous spectrum, as it were—I cannot agree with Dr. Kaempffert's statement that "the plain truth is that there is no difference between 'pure' and applied science, * * * nor is there any difference between the research approach of an industrial and a university laboratory." From considerable personal experience I should say that while, of course, there is no difference in methodology or techniques, as to goals there is as much difference as between red and blue.

There is only one proved method of assisting the advancement of pure science—that of picking men of genius, backing them heavily and leaving them to direct themselves. There is only one proved method of getting results in applied science—picking men of genius, backing them heavily, and keeping their aim on the target chosen.

OSRD, of which THE TIMES and Dr. Kaempffert speak highly, has achieved its results by the second procedure, which is applicable to Government-financed research in wartime because the targets can be chosen with a reasonable degree of certainty. Your editorial referring to OSRD says "it organized, planned and directed." It did that because its objective was not to advance science but to devise and improve instrumentalities of war. Any advancement of science was a pure by-product, and it was the task of those in control to keep such by-products to a minimum. We owed it to the men who were risking their lives in combat to see to it that every dollar and every

Responsibilities Interconnected

If I read the report correctly, Dr. Bush and his advisers are assuming a continuation of a system of industrial organization and management in this country essentially the same as the one now in existence—the one to which both major political parties pledged their allegiance in the last election. If, on the other hand, a partial nationalization of industry is to be envisaged such as the Labor party has announced will be put into effect in Great Britain, a totally different frame of reference must be assumed. Under these conditions there would be, indeed, "no sound reason why the approach of the great industrial laboratories could not be adopted in Government research," to quote again from your editorial.

Under these conditions, for example, with the coal industry nationalized, the responsibility of the Federal Government for future developments in the extraction and utilization of coal would be parallel to the responsibility of the telephone company for the improvement of telephonic communication. But under the present arrangements, which I personally believe preferable for the United States, Government has no such industrial control and therefore no responsibility for industrial research. A moment's consideration of the close interconnection between research, development and production makes evident that the one cannot be divorced from the other.

man-hour was expended for just one purpose, namely, to hasten the day of victory.

Research of this nature, like that in industry, can be effectively organized and planned because there are very definitely defined objectives. And in the case of OSRD the defining of these objectives was possible because of close cooperation and frequent consultation with the "users"—the Army and the Navy, those who had control and responsibility for achieving very specific ends. At the same time it should be pointed out that OSRD operated in such a manner as to give the maximum of autonomy to its many scientific divisions with the minimum of centralized control.

How different the situation is in a university laboratory can be realized, perhaps, only by those who have tried to advance science by their own labors for many years. Sir Alexander Fleming's remarks at Cambridge the other day concerning the discovery of penicillin should be required reading for all who are interested in this subject. Of course, advances in pure science and organized directed applied research may be carried out in the same organization, or even at different times by the same individual. The war work of numerous distinguished physicists and chemists alone proves this point. Wise management of a few industrial laboratories has allowed time and facilities for certain men to carry out investigations in pure science, and as a result several Nobel Prize winners have come from industry, as THE TIMES points out. But I doubt if any one of these men would testify that the work for which he received the prize was organized and directed by anyone but himself.

Direction Held Waste

Similarly in Russia, all the evidence I have been able to obtain indicates that Russian science is organized and directed in so far as it concerns definite practical goals, and under socialism all these goals are the responsibility of the Government. In so far as the Russian scientist is concerned with basic research he operates exactly as does a leading professor in a well-supported university laboratory. Of course, stupid management in industry or in Russia might try to direct the scientist in his efforts in those fields where the goals cannot be defined, but to the extent that this occurs talent is stultified and time and money wasted.

In short, in my opinion the distinction between pure and applied research is far from being futile; it is fundamental to a clear understanding of the subject of the organization of science. It certainly is fundamental to an understanding of the way the OSRD has been organized and operated. Almost by definition, the important advances in pure science are unexpected; the men who have turned the unlooked-for corner are the pioneers whose memory we now revere. Their successors will work in the same unorganized and undirected way as they did, be they Russians, employes of American corporations or university professors. Along with their discoveries will go a vast amount of organized research directed at definite goals. Whether or not such research should be in the hands of the Federal Government depends on whether or not the United States wishes to go as far down the road of socialism as do our British friends across the sea.

JAMES BRYANT CONANT,
Chairman, National Defense Research
Committee, OSRD.

Washington, Aug. 10, 1945.

A reply to Dr. Conant's interesting letter will be published in a later issue.

Japan Belittles Effect Of Our Atomic Bomb

The damage done to Hiroshima by the atomic bomb was minimized yesterday by the Japanese radio in Singapore, which quoted a Domei correspondent as saying that the city's air-raid shelters "were strong enough to resist the explosion."

The broadcast, recorded by the Columbia Broadcasting System, said: "Although the destructive power of the new atomic bomb must not be underestimated, there is much exaggeration about this in the American press, declared a Domei correspondent who recently visited Hiroshima." The correspondent described the atomic bomb as being "attached to a parachute."

The Mayor and two other high Government officials were killed in the raid, Domei disclosed in a wireless dispatch recorded by the Federal Communications Commission.

U.S. ALONE CAN MAKE BOMBS FROM ATOM

Howe Says That Neither Canada Nor Britain Is Aware of Manufacturing Secret

OTTAWA, Aug. 13 (U.P.)—The United States is the sole custodian of the manufacturing secrets of the atomic bomb, Munitions Minister C. D. Howe revealed today.

The United States, Great Britain and Canada share the scientific knowledge from which came those manufacturing process, but left it to the United States to develop that knowledge into a weapon.

"Canada has the right to ask for all the details of manufacture, but so far has not done so," he said.

He refrained from asking, he continued, because Canada did not want to know lest a dissemination of the information should result in a leakage. Great Britain had taken a similar attitude, he said.

Canada's role in the development had been to supply "the essential raw materials." He said Soviet Russia had known that her western Allies were experimenting with atomic force, but was not associated with developing the bomb.

Twenty exploration parties now are prospecting for uranium, the raw material, in the Great Bear Lake area. Canada has one of the world's largest deposits of pitchblende, from which uranium is derived. Private prospecting has been forbidden by Order-in-Council, Mr. Howe said.

Mr. Howe revealed that the Government had set up a scientific committee to investigate the possibility of applying the atomic principles utilized in the bomb to medical science. He suggested that the radio active by-products of the exploding uranium atom might open up a new field for cancer research.

Monopoly Disturbs French

By Wireless to THE NEW YORK TIMES.

PARIS, Aug. 13—An editorial in the Figaro tomorrow will ask how the United States and Britain will use the atomic bomb while they enjoy the sole power to use it.

This period will probably not be long, the Figaro will say, since the scientists of all the great nations have long been seeking control of sub-atomic energy. But for "a certain number of months the United States will have probably irresistible power over the inhabited world—power whose use or abuse cannot be prevented."

The article will cite President Truman's statement that the secret will be kept in the interest of world peace. But the Figaro seems doubtful, for it adds:

"It remains to be seen how the United States and its British ally will use the period during which they will enjoy the double privilege of being feared by all and of fearing none. This period will be more laden with consequences for the future of the world than any of the past. If the power to wipe a nation off the face of the earth in a few hours should be made to serve economic ambitions and the will to dominate, the outlook would be hopeless. But real peace may result from this incredible event. The great problem of the near future is the question whether the Anglo-Saxon world policy will show wisdom and justice in proportion to the prodigious weapon now at its disposal."

To Ask U. S. Ban on Weapon

WASHINGTON, Aug. 13 (AP)—Representative Louis Ludlow, Democrat of Indiana, announced today that on the day Congress reconvenes, he would introduce a House resolution urging the President, Secretary of State and the American representative on the United Nations Security Council to exert their utmost efforts toward a post-war agreement to ban the atomic bomb forever as an instrument of war and to develop its principles for peaceful uses.

and the United States at the expense of the Soviet Union," The Daily Worker said. Its editorial cited an article by The Sunday Observer's diplomatic correspondent, declaring that he had speculated on the effect that this "American - British monopoly" would have on the settlement of political questions concerning the Dardanelles and southeastern Europe.

"Expressions of this kind are also to be found in the United States," the editorial said.

New Zealand Reveals Role

By Cable to THE NEW YORK TIMES.

WELLINGTON, New Zealand, Aug. 13—Seven New Zealand scientists were dispatched to form part of the team that perfected the atomic bomb, the Ministry of Scientists and Industrial Research disclosed today.

The formation of the New Zealand group resulted from consultations between a New Zealander, Col. Ernest Marsden, himself a major discoverer in the atomic field, and British leaders early in 1944.

Because of his association with Lord Rutherford, Colonel Marsden was approached by Sir John Anderson and suggested recruits for his scientific team.

WORLD ATOM RULE BACKED

Colombian Writer Favors Bomb Control by Security Council

By Cable to THE NEW YORK TIMES.

BOGOTA, Colombia, Aug. 13—Discussions of the devastating effects of atomic bombs have filled Bogota's newspapers of the last few days.

Eduardo Zalamea of the Espectador suggested that, once Japan had surrendered, the bomb should be put in the custody of the World Security Council to keep such a powerful weapon from the hands of one nation. He said that this would be a gesture of democratic good-will toward the world by the United States.

33 Killed Building Bomb Plant

OAK RIDGE, Tenn., Aug. 13 (AP)—The Clinton Engineer Works, home of the atom bomb, was built at a cost of thirty-nine lives, J. R. Maddy, district safety engineer, announced today.

BRITISH BISHOP RAPS USE OF ATOMIC BOMB

By Wireless to THE NEW YORK TIMES.

LONDON, Aug. 13—The Right Rev. George Kennedy Bell, Bishop of Chichester, today condemned the Allies' use of the atomic bomb.

In a letter to The Times of London, the Bishop wrote that the destructive motive that impelled the discovery and its first use to obliterate two towns "surely are things which all who care for man's moral equipment are bound to condemn."

The letter of the Bishop, who once said of the bombing of German towns that it "must cause great searching of heart among those who were resolute champions of the Allied cause," also asserted:

"At the beginning of the European war no words were too bad for the bombardment of Warsaw and Rotterdam and in its closing stages the use of V-bombs was similarly censured. But the havoc then wrought by the German forces cannot be compared with the ruin caused in Hiroshima and Nagasaki by the atomic bomb."

In conclusion the Bishop wrote:

"There are certain deeds which science should not do. There are certain actions for which scientists should not be made conscripts by any nation. And surely the extermination of any civilian population by any nation is one of these."

Says Bomb Metal Is Hardest

DETROIT, Aug. 13 (U.P.)—The Carboly Company revealed today that a metal of unprecedented hardness was used in the atomic bomb.

IRE OVER ATOM BOMB BARS CHURCH SERVICE

By Wireless to THE NEW YORK TIMES.

LONDON, Aug. 15—Church bells rang peals of victory today all over Britain but the bells of St. Albans Abbey in Hertfordshire were silent. A civic service of thanksgiving for peace was banned under orders of the Very Rev. C. C. Thicknesse, dean of St. Albans, who was responsible also for the fact that the abbey's bells were silent.

Dean Thicknesse issued the orders because he said he could not give thanks to God for a victory won by the atomic bomb.

"I cannot honestly give thanks to God," he said, for an event brought about by an act of wholesale indiscriminate massacre, which is different in kind from all the acts of open warfare hitherto, however brutal and hideous."

Atomic Bomb Censorship Stays

WASHINGTON, Aug. 15 (U.P.)—The War Department warned today that the cessation of hostilities with Japan would not alter security limitations on the release of information on the atomic bomb. "All individuals, groups and organizations connected with the Manhattan Project will continue to comply with present security regulations," the War Department said.

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Screen News and Views

Movie Companies to Release Film Reels on Atomic Bomb

By Irene Thirer

With the civilized world agog over the development, use and effect of the atomic bomb, two movie companies announce forthcoming releases which have to do with the scientific marvel of this (and any) age. From 20th Century-Fox comes word that the company's forthcoming production, titled "The House on 92d Street," was made secretly in New York, Washington and other locales. It is based entirely on records of the FBI which has been actively engaged in protecting the vital secret of this greatest war weapon of all time.

Darryl Zanuck, vice president of 20th Century-Fox, says that "The House on 92d Street" is "a full-length feature film depicting the development of the atomic bomb and the work of the Federal Bureau of Investigation in counteracting the attempts of enemy agents to obtain the secret."

Continues Zanuck: "The actors, actresses and technicians who worked on the picture did not know that the story dealt with the development and protection of the atomic bomb. Those portions of the film were omitted from the screenplay until after the White House announcement of the use of the bomb in Japan."

The picture was produced by Louis de Rochemont and directed by Henry Hathaway. Lloyd Nolan, William Eythe, Signe Hasso and Leo G. Carroll have the professional leads: "Miracle Makers"

Warner Brothers' cinema contribution concerning the atomic bomb is a short subject, "Miracle Makers," now ready for public showing.

This reel, according to Warners' technical department, presents

the only motion picture footage of the atom smasher which played a large part in the experiments leading to the development of the atomic bomb.

Developed by Nobel prize winner Dr. E. O. Lawrence of the University of California, the cyclotron, as it is called, up to now has only been seen in still photographs. Dr. Lawrence technically advised the film, and also appears in it. Bookings on the subject will start Sept. 1.

SAYS ATOM SMASHER MAY HELP SAVE LIVES

BERKELEY, Calif., Aug. 15 (U.P.)

The University of California cyclotron, used in the development of the atomic bomb, is destined for even more important service as an instrument that may lead to the conservation of life, John E. Lawrence, physicist, said today.

At the same time Mr. Lawrence announced the recent discovery of two new elements, neptunium and plutonium, which are 93 and 94 on the element scale. The nature of these elements was not revealed, but both are products of uranium, the vital element in the atomic bomb.

Arthur C. Wahl Jr., 28, a graduate student, discovered plutonium, and Prof. Edwin H. McMillan found neptunium. Mr. Lawrence heads the university's new Division of Medical Physics, created to engage in research in life-saving developments.

He said that the atom smasher would be used to open fields in the treatment of disease by means of artificial radioactivity.

In a statement outlining medical development in the field of nuclear physics, Mr. Lawrence said that contributions to human welfare destined to come from the new research "have implications for the future which may be more important even than the atomic bomb."

When Dr. Ernest Orlando Lawrence, brother of Mr. Lawrence, began his studies of the structure of matter that led to the invention of the cyclotron and a Nobel prize, he thought neither of producing bombs nor treating disease. But he and his brother discovered that the device was the perfect instrument for producing artificial radioactivity.

As a result, medical and biological problems now may be attacked by teams of physicists and medical scientists, John H. Lawrence said. But just as important, he added, was the fact that radioactivity had cleared the way for study of human disease from a basic viewpoint—the fundamental processes of plant and animal life and the chemical processes of the human body.

Specific diseases to be studied in this connection include cancer, leukemia and polycythemia vera, a rare blood disease. Radioactive chemicals already are an established treatment for the latter malady, but experimental neutrol therapy in the treatment of cancer will be extended. N.Y.T. 8/16

Round Up Reich's Atom Scientists

London, Aug. 14 (Reuter)—All German scientists known to have been connected with German experiments on atomic bombs have been located, according to dispatches from Germany to the Daily Mail. Most are living in the U. S. zone, in Bavaria, or in Austria on the shores of the lake near Zeil.

The Germans were a year at least, and probably more, behind the Allies in their experiments, the dispatch said.

"Their attention had been directed more to perfecting a radio-guided rocket which would have been able to fly over Britain, take reconnaissance photographs and return to the base from which it started."

Our Use of Bomb Approved

We Should, It Is Held, Be Thankful for Instrument Which Aided Victory

TO THE EDITOR OF THE NEW YORK TIMES:

8/16
Graduates of Princeton University of my era, if they do not know William Church Osborn personally, at least know enough about him to be aware of his long and distinguished career and of the high esteem and respect with which he is regarded.

It is, therefore, in no spirit of questioning the sincerity of his convictions but rather with a feeling of regret that I find myself in complete disagreement with the condemnation expressed in his recent letter to THE TIMES of the use by our armed forces of the new atomic bomb. Mr. Osborn writes: "We will think with shame of the first use to which it (the atomic bomb) was put." It is my opinion that only a minority will concur in that verdict, and certainly on my own behalf I want to protest vigorously against even an implication of being included among the "we" who subscribe to any such view.

One recoils, of course, at the wholesale extermination of human beings, but that is precisely what war is today. War is a senseless, dirty, brutal operation, and if we don't put a stop to it now we shall eventually have a sphere whirling in space inhabited only by the lower forms of animal life to carry on the processes of evolution.

We, as a nation, are not to blame for the monstrous advances made in the science of war, nor that women, and indeed the whole civilian population, being quite as essential to its waging as the fighting men themselves, have become the objects of its merciless fury.

Mr. Osborn says "there was no pretense of precision bombing for military purposes." Hiroshima is (or was) a manufacturing and distribution center and the military purpose of bombing it is obvious. As for precision, just what more accuracy does Mr. Osborn call for from a height of, say, four or five miles at a speed, I suppose, of several hundred miles an hour?

By circumstances the most fortuitous in all history we and our Allies were the first to have in our possession this terrifying instrument of war. With it we have brought the war to a conclusion. With its terrible potentialities it bids fair to be the instrument by which humanity will preserve itself from all future wars. That our Government had the courage, the foresight and the wisdom to resolve as it did the challenge of the grave decision which confronted it need never, as I see it, bring the red blush of shame to any American, but rather a sense of thankfulness and pride.

WILLIAM O. MORSE.

Greenwich, Conn., Aug. 14, 1945.

Plea for Young Scientists

TO THE EDITOR OF THE NEW YORK TIMES:

The success of the immense research project which developed atomic power is not due to any small group of men. Success was achieved only after thousands of chemists, physicists and other scientists had struggled day and night to perfect new techniques and overcome heartbreaking problems.

The young scientists both in and out of uniform have had to maintain complete silence as to their activities during the last few years. The civilians, unjustly called slackers by their friends and neighbors, were unable to answer these accusations satisfactorily.

They could only have confidence in the ultimate success of the work and its undeniable justification.

Now that the race is over, wouldn't it be fair to enable the men who have served their country in their most efficient position to publicly exonerate themselves?

A few thousand scientists, given guns and put into the armed services would have a negligible effect on the progress of the war. These same scientists, given laboratory facilities, have brought Japan to her knees in seventy-five hours.

There were also many soldier-scientists employed on the project who did the same dangerous work that the civilians did. Wouldn't it be fitting that these soldier and civilian scientists be given tangible recognition of their contribution to our rapid victory?

S. J. S.

Brooklyn, Aug. 13, 1945.

Story of Scientists' 'Battle' for Atom Bomb

By WALDEMAR KAEMPFERT

From a 30,000-word report prepared by Prof. H. D. Smyth of Princeton and released by the War Department, it appears that the active material in the atomic bomb that wiped out much of Hiroshima and Nagasaki is plutonium, obtained from uranium and otherwise known as U-239.

Earlier accounts indicated that U-235 is the explosive substance. A bomb could be made with U-235 which would be just as effective as if U-239 were used. In fact, according to Professor Smyth, the British were working on a U-235 bomb while we were still weighing the possibilities of plutonium. We also use U-235, but only in huge plants to make plutonium.

Plutonium is an artificial, or man-made, radioactive material. It is obtained by bombarding uranium-235 with neutrons, but not directly. After bombardment U-235 becomes neptunium, another element not found in nature, and this neptunium, which is also radioactive, shoots out an electron (beta ray) and thus changes back to plutonium. This plutonium, though radioactive, is fairly stable as the heaviest elements go, and it is just as effective as U-235 in a bomb.

Uranium Found to Vary

The numbers 235, 239 and others to be mentioned need explanation. Hydrogen is the lightest form of matter. Its atomic weight is therefore designated by the numeral one. Uranium, heaviest of all natural elements, is at the bottom of the list. It is 238 times heavier than hydrogen. Therefore, natural uranium is designated U-238.

Long before the war it was found that this natural U-238 is really a mixture of several uranums, which were both lighter and heavier. So we have 234, 235, 238. There are also several forms of hydrogen, oxygen, carbon, lithium, lead. In fact, virtually every element has what are called "isotopes." An isotope of hydrogen or of uranium is indistinguishable chemically from another of hydrogen or uranium, as the case may be. But the physicist can tell one from another by weighing it with the aid of special instruments called mass spectrometers.

Most of the uranium in the world is U-238. This is a radioactive element which breaks down into radium in the course of millions of years by shooting bits of itself away. The radium in turn breaks down into lead in the course of thousands of years. Neptunium is also radioactive and breaks down in a short time into plutonium, and plutonium in turn breaks down into U-235. All this must be borne in mind to understand Professor Smyth's report.

Nature produces all these elements by means of radioactivity. In other words, uranium, radium (in all its forms), actinium, polonium, plutonium, neptunium are spontaneously changing themselves into something else, a process called transmutation. Most elements, such as iron, copper, carbon, silicon and the familiar gases, are "settled," so to speak. They are probably the end-products of radioactivity that began a billion and a half years ago when the earth was formed.

From radioactive elements come beta rays, which are electrons; gamma rays, which are like X-rays but much more penetrating, and alpha particles, which are the nuclei or cores of helium atoms. For many years after radioactivity was discovered these were the only projectiles that the physicist could fire at atoms, break them up and thus find out how they are constructed. Later they added protons, which are the nuclei of hydrogen atoms. Still later came deuterons, which are the cores or nuclei of heavy-hydrogen atoms. Because of their mass, these were also fired at atoms in the hope of breaking them up.

Neutron Key to Discovery

That hope was long cherished in vain. The atom is held together by powerful, electrical cohesive forces. The nucleus, which is the real, physical atom, is surrounded by planetary electrons which revolve in concentric orbits and leap from orbit to orbit in unpredictable ways. When the particles named were hurled at the nucleus they were simply captured or sucked in. Rarely did they reach the nucleus, and when they did they only chipped it. A particle would be hurled out, some energy would be released, and there the effort ended. Much, however, was learned about the constitution of matter.

In 1932 a new atomic particle was discovered by Sir James Chadwick in England. This was the neutron. As its name indicates, it is electrically neutral. In other words, it could not be attracted or repelled by electrically charged particles within the atom. Where a proton had one chance in 100,000 of hitting the nucleus of an atom, a neutron had one chance in 140. Here it is well to point out that neutrons can be driven out of atoms by bombarding them. Thus bombarded beryllium and boron release neutrons which in turn are directed at other atoms to disrupt them. Beryllium, of which there were only a few pounds before the war in this country, is probably used in producing material for the bomb.

"In 1939 two German physicists, Drs. Otto Hahn and E. Strassmann, fired neutrons thus produced at uranium. For the first time in history, a bull's eye was scored in a nucleus. The uranium nucleus split in two. The two parts were no longer uranium, but barium and perhaps krypton, a rare gas in the atmosphere.

In that same year, 1939, Drs. O. Frisch and Lise Meitner, both later driven from Germany, advanced an explanation of what had happened. When it split, uranium was not only converted into something else, but enormous amounts of energy were released. The energy of the neutron that did the splitting was only one-thirtieth of a volt. But out came 200,000,000 volts—six billion times as much.

All this was calculated with the aid of a simple equation of Einstein's presented in connection with the special theory of relativity in 1905. The equation showed that

matter is simply concentrated energy, that energy can be converted into matter and matter into energy, that if a particle can be given velocity enough its mass will increase. Einstein even went so far as to point out that his prediction could probably be verified by studying the radioactive elements. It has been verified not only in the laboratory but in producing material for the bomb and by the bomb itself.

Ever since radioactivity was discovered, physicists had been saying that in ordinary matter enormous amounts of energy are contained. Radioactivity proved it. But ordinary matter, which is settled and peaceful, also contains energy. Hahn and Strassmann had proved the case. For the first time more energy had been freed from an atom than was driven into it.

Discovery Confirmed Here

This was a discovery of sensational importance. Physicists were excited. The first news of the achievement and of the explanation given by Drs. Frisch and Meitner was brought to this country by Niels Bohr, Denmark's distinguished Nobel Prize winner. After listening to Bohr, Drs. J. E. Dunning and George B. Pegram of Columbia confirmed what had been done in Germany. Enrico Fermi, exiled from Italy by Mussolini, was with them. In Italy he had fired neutrons at a whole series of atoms and obtained new isotopes—

a whole series. But no great amount of energy.

Bohr and Fermi attended a conference on theoretical physics in Washington on Jan. 26, 1939, as Professor Smyth tells the story. There the two discussed fission, as atom-splitting is called, and Fermi suggested the possibility that when uranium or some other suitable element was struck by a neutron, out would fly other neutrons from the nucleus. The reason was that a nucleus is composed of protons and neutrons, and one element differs from another only in the number of its protons and neutrons, which number of protons determines the number of planetary electrons that revolve around the nucleus. The released neutrons, reasoned Fermi, would bombard neighboring nuclei, and thus what is called a "chain reaction" would be started, the very chain-reaction now utilized in producing plutonium and setting it off in a bomb.

Fermi's speculations were confirmed in half a dozen American university laboratories and also in Europe. Physicists here saw the military possibilities of chain reaction. Hitler was already on the march and nobody knew what German scientists might do in developing an atomic bomb.

According to Professor Smyth, the first contact was made with Washington in March, 1939, which shows that physicists here lost no time. Professor Fermi and representatives of the Navy held a conference. The Navy was interested and asked to be kept informed. Einstein was drawn in. A letter of his to President Roosevelt resulted in the appointment of the Advisory Committee on Uranium. In 1940 this committee was merged with the newly formed National Defense Research Committee, but it preserved its identity. Contracts to carry on research were made with universities and the Standard Oil Development Company. By November, 1941, the projects numbered sixteen, totaling \$300,000.

Drs. Harold Urey and George B. Pegram went to Europe to find out what the British were doing to develop an atomic bomb. There effort was concentrated on U-235. When Urey and Pegram returned, work here was pushed and President Roosevelt saw to it that British and American physicists pooled their knowledge and skill. In the end an international group brought the bomb to perfection. It included not only the most distinguished American and British physicists, but Fermi, an Italian, and Bohr, a Dane, not to mention other refugees, who were Hungarians, Russians and perhaps nationals of other countries for all we know.

Project Dwarfs All Others

It had been estimated that 500,000 tons of TNT would be required to devastate Germany's military and industrial targets. One to ten tons of the right kind of uranium would do the same job. This amount of uranium may seem small; actually it is colossal. Not more than a microgram had been separated before the war. A microgram is one-millionth of a gram, and there are thirty grams to the ounce.

By this time it became necessary to separate the uranium program entirely from that of the Office of Scientific Research and Development. The bomb was bigger than anything ever attempted, bigger than all the work of the office put together. It was a case of the tail's wagging the dog. A small group thereafter directed bomb research in accordance with a program of its own.

The directing group first had to make up its mind about the element that was to explode in a bomb. It could not be uranium-238, the common, plentiful form. That would not break up when neutrons hit its nucleus. Thorium and protoactinium might be used, but they were hard to obtain. The selection narrowed down to U-235 and U-239 (plutonium).

Secret Revealed in Smyth Report

If U-235 was to be used it had to be separated from U-238. In a ton of U-238 there are only fourteen pounds of U-235. Separation was slow and difficult. It would have taken about 75,000 years to concentrate a pound of U-235 by the methods adopted before the war. Moreover, the total amount of uranium in the country was only a few grams, and this was of doubtful purity. An immense amount of research was conducted to devise more rapid processes. According to Professor Smyth, some of these were good. Research in this direction is still going on.

Moreover, the whole theory of chain reaction needed research. The physicists had only Fermi's experimentally verified speculation that a chain reaction does occur when uranium-235 is bombarded with neutrons. There are fast neutrons, slow neutrons and neutrons of intermediate speed. The slow

neutrons split U-235, but not U-238. At certain speeds U-238 simply captures neutrons. To achieve chain reaction impurities in uranium must be removed, for these will capture neutrons without breaking up nuclei and the "impurities" included various forms or isotopes of uranium.

After much discussion and experimenting it was decided to purify ordinary uranium-238 as much as possible, bombard it with neutrons of the proper speed, let these neutrons convert the U-235 in the mass into neptunium, whereupon the neptunium would change to the desired plutonium. As for the plutonium in the bombarded mass of pure U-238, that was to be separated chemically, which was theoretically possible because plutonium is as different from uranium as gold is from iron.

It was a bold decision, as Professor Smyth tells the story. Nobody had ever tried to make plutonium in this way and nothing was known about the chemistry of plutonium. Besides, the neutrons had to be slowed down by a substance called a "moderator" if they were to split up U-235. The best moderators were graphite, heavy water and paraffin.

Professor Smyth's report throws light on the quantity production of heavy water in Norway. We had nothing like that plant. It was known that the Germans were trying to develop an atomic bomb and there was no doubt that the plant in Norway was to produce enough heavy water for their purpose. Now we know why Norwegian patriots blew up the German heavy-water plant. Professor Smyth presents many such facts in his report—facts that explain why bold decisions had to be made. Time was pressing. A laboratory battle was on between the international group in America and Hitler's group.

It was Fermi who suggested that graphite be used to moderate the speed of neutrons to bombard a mass of uranium and hit the U-235 in it. He, too, did much to show how the chain reaction could be controlled. Research was necessary because, as Professor Smyth says, "there was a possibility that a chain-reacting system might get out of control." The chain reaction must occur with flashlike rapidity, yet in a known time; otherwise only a small amount of atomic energy is utilized before the bomb flies apart and the reaction stops. Professor Smyth remarks that "this entire 'detonation' problem was and still remains one of the most difficult in designing a high-efficiency atomic bomb."

The chain reaction, once started, had its dangers. The fragments resulting from atom-splitting are usually radioactive, which means that rays are emitted which have deadly effects akin to those of X-rays. Since the radioactive fragments differ chemically from uranium, Professor Smyth points out the possibility of extracting

and using them "like a particularly vicious form of poison gas."

In fact, the "fission products produced in one day, run of a 100,000-kilowatt chain-reacting pile [of uranium] might be sufficient to make a large area uninhabitable." There was no intention on the part of the scientific group here to develop a radioactive poison gas, but nobody knew what the Germans might attempt. Hence "defensive measures were planned."

First Chain Reaction Achieved

By the fall of 1942 enough graphite (the moderator), uranium oxide (raw material of all the uranums) and uranium metal had been accumulated in Prof. A. H. Compton's laboratory in Chicago to test a self-sustaining chain-reaction pile for the production of plutonium. Nobody knew what would happen. Control strips were incorporated. "This was fortunate," comments Professor Smyth, "since the approach to critical condition was found to occur earlier than had been anticipated."

The pile was operated on Dec. 2, 1942, "the first time that human beings ever initiated a self-maintaining nuclear chain reaction." At last success had been achieved. The credit goes largely to Prof. Enrico Fermi, the general director.

The real objective, however, was to produce U-239 or plutonium in large quantities. This pile operated at a maximum of only 200 kilowatts. To produce a kilogram (2.2 pounds) a day a chain-reacting pile had to release energy at the rate of 500,000 to 1,500,000 kilowatts. Fermi's little pile would have to be kept going for at least 70,000 years to produce a single bomb. So it was decided to proceed to large-scale production at once.

There still remained the problem of separating the plutonium chemically from the bombarded pile. A big new building had to be erected for chemists late in 1942 and this has since been enlarged. Here the chemists found out how plutonium could be separated from the uranium that had been bombarded. The prospect of a bomb now looked rosy.

A large-scale plant was ordered, and Clinton, Tenn., was selected as the site, chiefly to produce plutonium. Professor Smyth says that in peacetime no industrial engineer would have proceeded without first building and testing a pilot plant. "It was much as if the hydroelectric generators at Grand Coulee had been designed merely from the experience gained with a generator of quite different type and of a small fraction of the power."

The plant now known as the "Manhattan District" in Tennessee, was built by the E. I. du Pont de Nemours Company without profit and with a repudiation of all patent rights. The company also undertook to build a large-scale plutonium plant at the Hanford Engineering Works in the State of Washington, which was selected

because it was far from any large community and far from Germany.

The plan of procedure was now clear. A specified, relatively large amount of plutonium was to be produced each day in designed water-cooled uranium-graphite piles, and the plutonium was to be extracted by chemical means from a pile after the neutrons had done their work. What the physicists call a "lattice" had to be built.

The lattice consisted of properly spaced rods of uranium in graphite. Such a pile could be unloaded and reloaded without tearing it down. It was relatively easy to push in fresh uranium rods and to remove bombarded ones containing plutonium. Because uranium gives off powerful rays, loading and unloading had to be carried out by remote control.

Because of the powerful radiations emitted by a pile, nobody dared go near it. Accordingly, says Professor Smyth, "the whole power pile has to be enclosed in very thick walls of concrete, steel or other absorbing material." Yet the pile has to be unloaded and loaded through these shields and water has to be carried in and out. Moreover, the shields have to be not only radiation-tight but also airtight, since air exposed to the ra-

diation in the pile becomes radioactive.

The danger of radiation is present almost everywhere in a bomb plant. The products of atom-splitting are always highly radioactive, so the uranium from a pile must be handled by remote control at every stage up to the point where the plutonium is relatively free from radioactive by-products of atom-splitting.

Timing Is Important

The loading and unloading must be nicely timed. Plutonium maintains the chain reaction while it is being created, but the U-235 gradually disappears and the products of atom-splitting, with much absorption of neutrons, tends to stop the reaction. So a schedule had to be worked out to govern the flow of uranium rods to the pile and to remove rods that had been processed to the chemical plant for the separation of plutonium.

Radiation also complicated the problem of piping cooling water to the intensely hot pile. The pipes had to be of material that would not disintegrate when bombarded by neutrons and gamma rays, which are very powerful X-rays. Besides, the pipes had to be leak-proof, corrosion-proof and warp-proof. To cap all this, water enough was needed to meet the requirements of a small city. Aluminum was finally selected, after misgivings. Apparently it served its purpose.

The Clinton pile started operating on Nov. 4, 1943. By June, 1944, all expectations had been considerably exceeded. "In ease of control, steadiness of operation and absence of dangerous radiation, the pile had been most satisfactory," Professor Smyth writes. There have been very few failures attributable to mistakes in design or construction.

By the end of January, 1944, metal from the pile was going to the plutonium-separation plant at the rate of one-third of a ton a day. By March 1, 1944, several grams of plutonium had been separated and delivered. Clinton served as a guide to Hanford in the matter of separating plutonium.

Even before it became possible to separate plutonium from a pile of uranium-graphite, preliminary studies of bomb design were being made. Dr. J. R. Oppenheimer of the University of California gathered a group together in 1942 for further theoretical investigation. By November, 1942, Los Alamos, N. M., had been chosen for the site of a bomb laboratory. It was situated on a mesa twenty miles from Santa Fé.

Dr. Oppenheimer arrived in March, 1943. He gathered a galaxy of scientific stars. Professor Smyth says that Dr. Oppenheimer is in charge of what is "probably the best-equipped physics laboratory in the world."

Bomb Design Exacting

Highly important was the matter of critical size of the bomb. When the critical size is exceeded it is impossible to prevent a chain reaction. There are enough neutrons, generated by cosmic rays,

by spontaneous fission reactions, by induced alpha-particle reactions, to initiate the chain reaction. "Thus until detonation is desired, the bomb must consist of a number of separate pieces, each of which is below the critical size," explains Professor Smyth. "To produce detonation the parts of the bomb must be brought together rapidly."

"The obvious method of very rapidly assembling an atomic bomb was to shoot one part as a projectile in a gun against a second part as a target," explains Professor Smyth. Another method to prevent premature detonation was to incorporate neutron absorbers in such a way that they would be rendered less effective by the initial stages of the chain reactions. Such devices for increasing the efficiency of the bomb are called "autocatalytic."

Just how the bomb is "assembled," Professor Smyth, of course, does not reveal. He contents himself with the statement that "a weapon has been developed that is potentially destructive beyond the wildest nightmares of the imagination; a weapon so ideally suited to sudden unannounced attack that a country's major cities might be destroyed by an ostensibly friendly power." He hints that it is possible to convert the matter in common materials into energy. A small percentage would be enough. If that ever happens, "civilization would have the means to commit suicide at will."

Professor Smyth thinks that "a great industry might eventually arise, comparable perhaps with the electronic industry." The consensus of his group is that the growth would be slow over a period of many years. He sees "no immediate prospect of running cars with nuclear power or lighting houses with radioactive lamps, although there is a good probability that nuclear power for special purposes could be developed within ten years and that plentiful supplies of radioactive material can have a profound effect on scientific research, and perhaps on the treatment of certain diseases in a similar period."

The Road Ahead *By Eleanor Roosevelt*

When word was flashed that peace had come to the world again, I found myself filled with very curious sensations. I had no desire to go out and celebrate. I remembered the way the people demonstrated when the last war ended, but I felt this time that the weight of suffering which has engulfed the world during so many years could not so quickly be wiped out. There is a quiet rejoicing that men are no longer bringing death to each other throughout the world. There is great happiness, too, in the knowledge that some day, soon, many of those we love will be at home again to give all they have to the rebuilding of a peaceful world.



One cannot forget, however, the many, many people to whom this day will bring only a keener sense of loss, for, as others come home, their loved ones will not return.

In every community, if we have eyes to see and hearts to feel, we will for many years see evidences of the period of war which we have been through. There will be men among us who all their lives, both physically and mentally, will carry the marks of war; and there will be women who mourn all the days of their lives. Yet there must be an undercurrent of deep joy in every human heart, and great thankfulness that we have world peace again.

These first days of peace require great states-

manship in our leaders. They are not easy days, for now we face the full results of the costs of war and must set ourselves to find the ways of building a peaceful world. The new atomic discovery has changed the whole aspect of the world in which we live. It has been primarily thought of in the light of its destructive power. Now we have to think of it in terms of how it may serve mankind in the days of peace.

This great discovery was not found by men of any one race or any one religion. It was international from the beginning, and its development and control should be under international auspices. All the world has a right to share in the benefits which may grow from its proper development.

Great Britain and Canada and ourselves hold the secret today—and quite rightly, since we used its destructive force to bring the war to an end. But if we allow ourselves to think that any nations or any group of commercial interests should profit by something so great, we will eventually be the sufferers. God has shown great confidence in mankind when He allowed them wisdom and intelligence to discover this new secret. It is a challenge to us—the peoples who control the discovery—for unless we develop spiritual greatness commensurate with this new gift, we may bring economic war into the world and chaos instead of peace.

The greatest opportunity the world has ever had lies before us. God grant we have enough understanding of the divine love to live in the future as one world and one people.

WEAPONS RACE IS DECRIED

Osservatore Romano Rebukes the Scientists Who Work on Them

ROME, Aug. 18 (AP)—The Osservatore Romano predicted today a "feverish race for secret weapons" in the post-war world and rebuked scientists who worked on them. The Vatican newspaper said in an editorial that an armament race was an inevitable consequence of the "last atrocious episodes of the war."

Discussing post-war prospects, the newspaper also objected to the transfer of persons from one country to another to eliminate national minorities. The newspaper said that while Pope Pius spoke of the rights of minorities and the need for protecting them the Potsdam conference "sanctions the principle of transfer, that is to say, the elimination of minorities."

"It is against natural rights to remove millions upon millions of persons from their homes, churches, cemeteries and the soil enriched by the work of their fathers," it declared. "It was unjust yesterday, and it is unjust and ungenerous today."

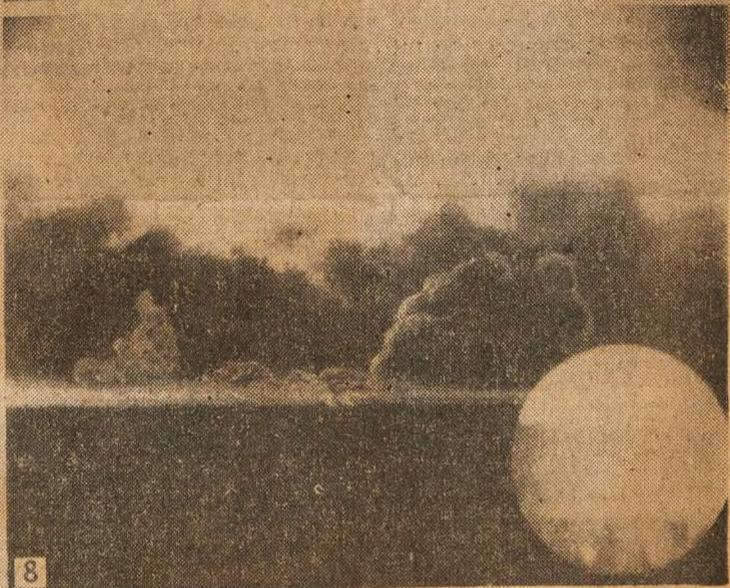
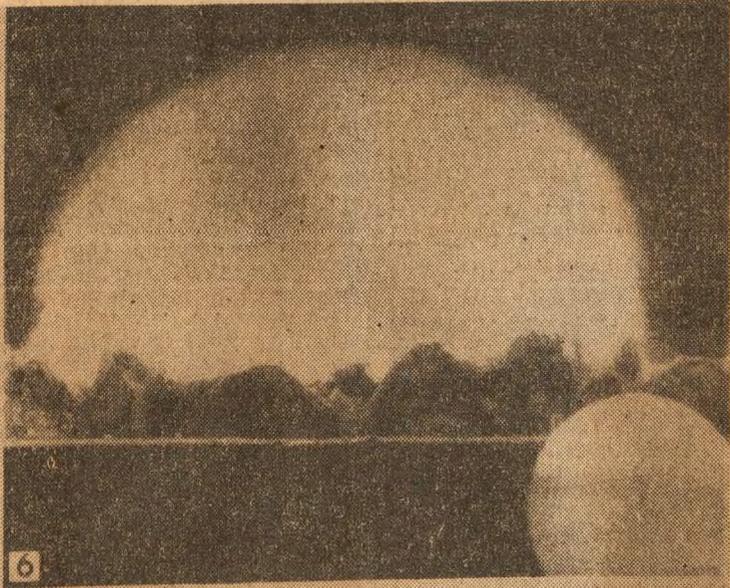
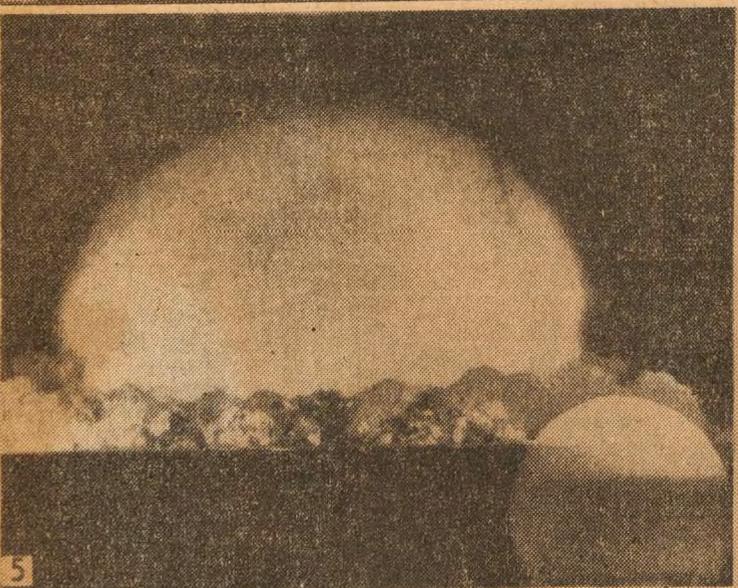
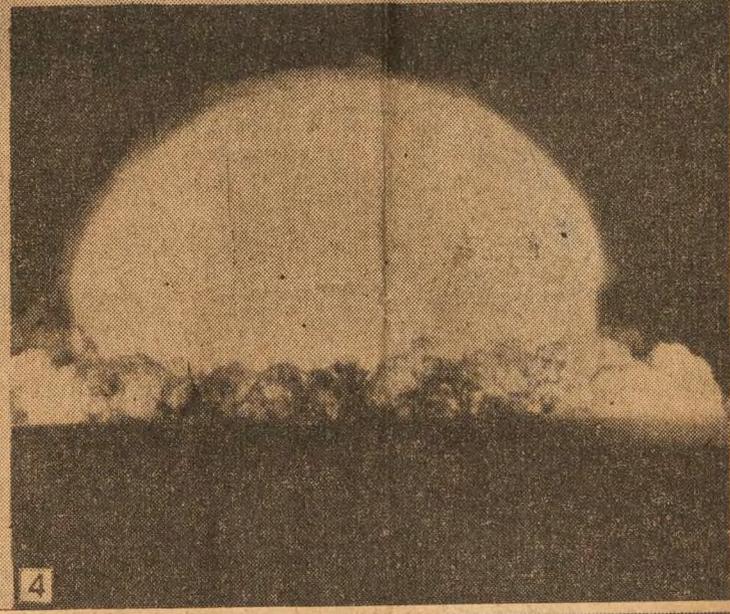
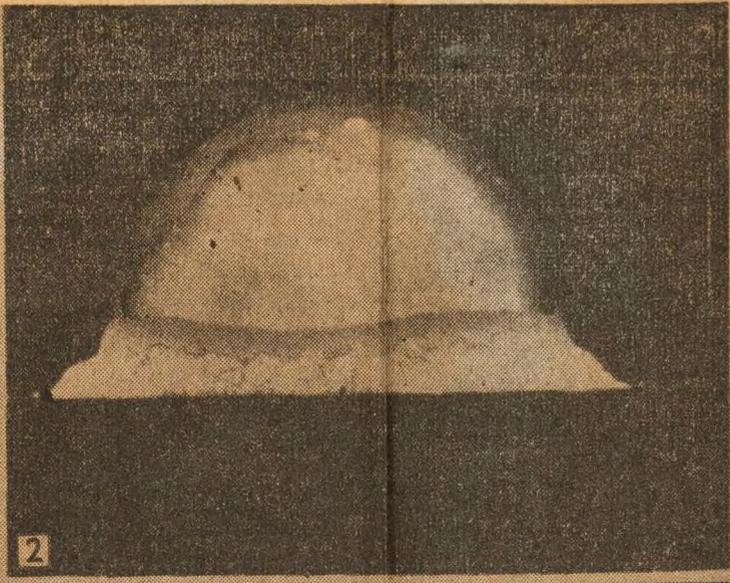
Declaring that peace would give rise to many "preoccupying questions," the paper said "for the first time in modern history men of science have directly associated themselves" with work on weapons. In the past, it remarked, science worked for the good of humanity, while warriors adapted their discoveries to "the art of killing."

Of anti-Fascist principles it said were enunciated by the Pope in a Christmas message when the Axis was progressing in the war, the newspaper asked, "To what extent do the architects of the new world have them in mind?"

It said that the rights of small nations were "not even talked about any more," declaring: "In fact, if not always in name, a few small states which desire autonomous life disappear without any one having anything to say about it."

It said that the Berlin conference promised liberty of speech, press and religion so far as Germany was concerned, but that "many millions of Catholics cannot communicate with Rome."

Mighty Explosion as First Atomic Bomb Was Tested on New Mexico Desert

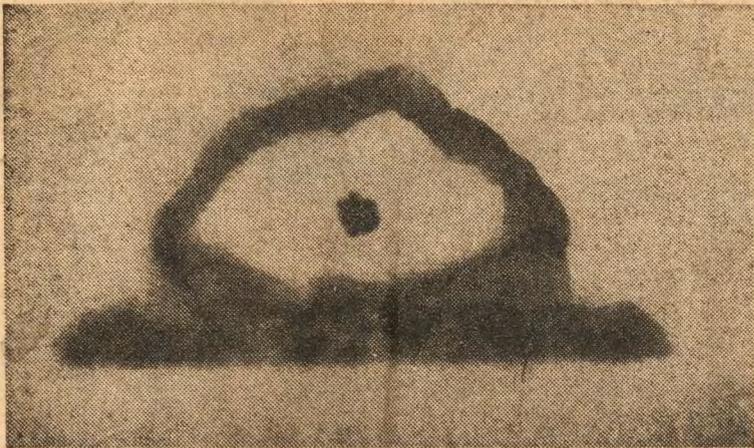


Associated Press from Army

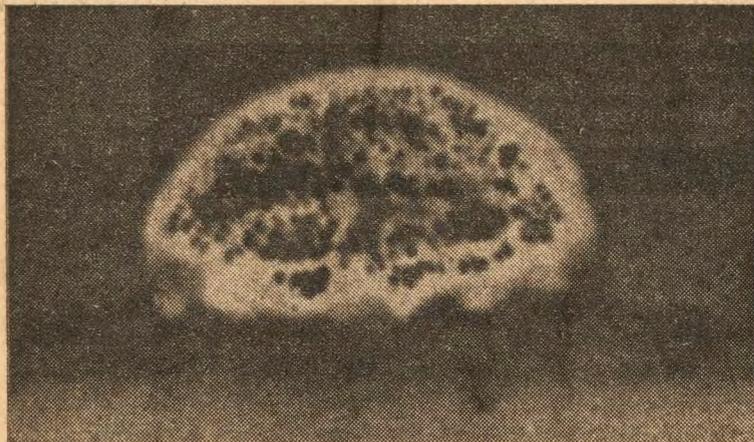
A series of motion-picture shots released by the Army yesterday showing the explosion that occurred when the first atomic bomb was tested on the New Mexican desert near Alamogordo on July 16. After the blinding flash shown in the first two pictures a layer of dust and smoke began to rise from the ground, eventually billowing up into a cloud that rose 40,000 feet into the air. These pictures were made from a distance of six miles, and the circle of light in the lower right corner of some is reported by J. H. Manley, of the bomb laboratory at Alamogordo, to be a photographic fault, probably a reflection in the camera lens, rather than a phenomenon related to the bomb's explosion

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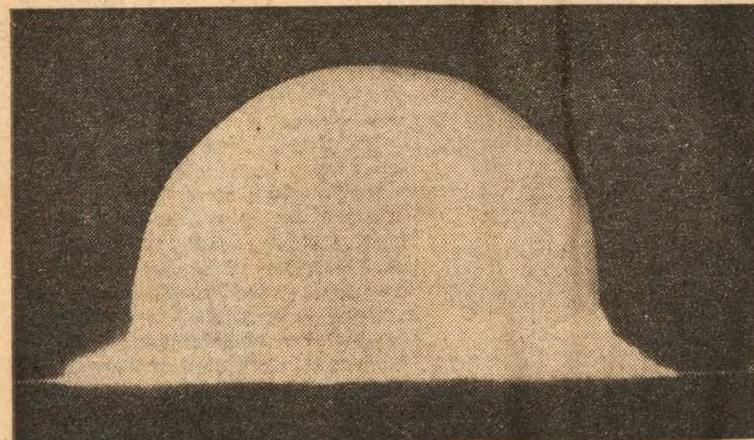
When Atomic Age Dawned in New Mexico



1. The explosion that will be heard through history came July 16 on the New Mexico desert. When the first atomic blast was touched off, it looked like this to an Army camera six miles away. . . .



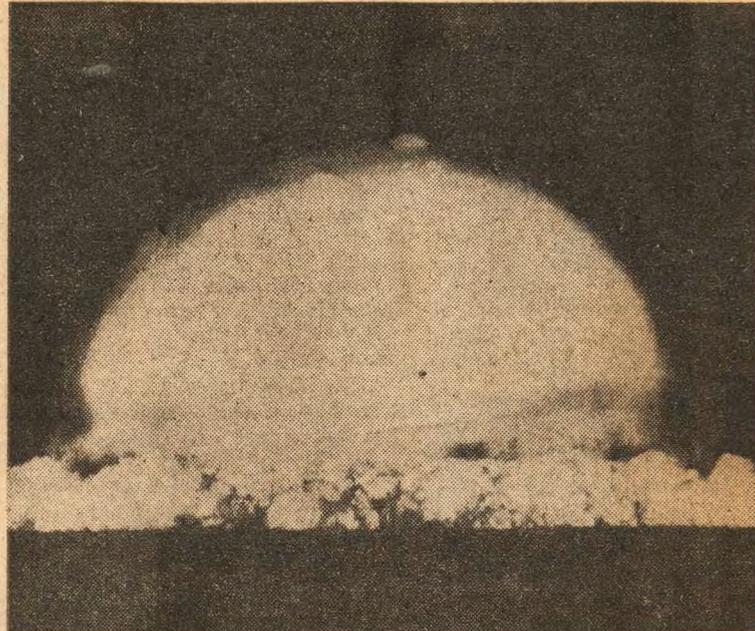
2. Multi-colored cloud assumes egg shape. Black spots actually are brighter than the sun at midday, causing a reverse on the photographic negative. . . .



3. The cloud of exploding white hot gases expands rapidly, forming almost a perfect igloo shape. . . .



4. Now the base of the great cloud begins to spread sideways, rolling out over the desert. . . .



5. Supplementary explosions within the cloud of gases start to "blow its top" with a high mushroom explosion which can be seen forming. Same phenomenon was noted in atomic bombings of Hiroshima and Nagasaki. . . .



6. This close-up of a section of the explosion looks like the heart of Hell itself. All these pictures were recorded in the briefest instant, long before the mighty and sustained roar of sound reached scientists sheltered six miles away, thundering the announcement of a new world era.

News of the Day Newsreel Photos From U. S. Army

P.M. 8/19

Era of ATOMIC ENERGY

Man's Control of Weather Seen Possible in Future

Editor's Note: David Dietz, Pulitzer Prize winner in Journalism, has reported for 25 years important researches in the atom. This is the second of articles by Mr. Dietz on the era of atomic energy.

By DAVID DIETZ,
Scripps-Howard Science Editor.

No baseball game will be called off on account of rain in the era of atomic energy. No airplane will by-pass an airport because of fog. No city will experience a winter traffic jam because of heavy snow. Summer resorts will be able to guarantee the weather and artificial suns will make it as easy to grow corn and potatoes indoors as on the farm.

Mark Twain complained that everybody talked about the weather, but that nobody did anything about it. They will do something about the weather in the era of atomic energy.

The reason is that for the first time in the history of the world, man will have at his disposal energy in amounts sufficient to cope with the forces of Mother Nature.

The size of these forces is something not quite understood. For example, I have heard people ask whether such explosions as those caused by the first bomb at Hiroshima and the second improved version at Nagasaki might not in time knock the earth out of its orbit.

They forget that the weight of the earth is in the neighborhood of five billion times a trillion tons (five followed by 21 zeros).

Outdoor Air Conditioning.

But while atomic bombs won't shake the earth out of its orbit, the use of atomic energy will enable man to deal with the forces of the weather in specific, limited areas.

It is the size of these forces that has made it impossible to deal with them in the past and that doomed all experiments in rain-making and the like to failure.

People do not always realize how the forces of the weather operate on a worldwide scale. The cold wave that arrives some winter day is composed of millions of tons of air that have blown down, literally, from the Arctic Circle.

Of course, Mark Twain was not entirely right. Man did something about the weather when he built houses and invented stoves. But this was indoor air conditioning and Mark was talking about outdoor air conditioning.

Perhaps the first successful attempt at outdoor air conditioning was when California orange growers learned to fight frost by putting smudge pots around the orchard in which oil fires could be lit.

Toward the end of the European phase of the war attempts were made to "punch" holes in fog over airfields by means of a circle of oil heaters. There were also experiments with systems of steam pipes buried in the field. These not only helped to dispel fog but kept the ground free of snow and ice.

Current Methods Puny.

Until now, the trouble with all such methods has been that they were too puny to deal with the forces of nature. And the reason that they were puny was because it was too difficult and too expensive to burn oil or coal in the



Jackie Swain looks over Florida foliage done in ice as result of unseasonable storm. In era of atomic energy this sort of thing could be avoided by man-controlled weather. Acme Newspictures.

amounts needed to do the job right.

To see why the situation is not going to be difficult in the era of atomic energy, let me repeat two figures that I mentioned yesterday:

One pound of uranium-235 will furnish as much energy as 10,000,000 pounds of gasoline. It will furnish as much heat as 20,000,000 pounds of coal.

Consequently, there is no reason why every airport in the world should not be carpeted with concrete in which a network of steampipes is buried. With uranium-235 as the fuel, it will be possible to generate any needed amount of steam to melt the heaviest snow or ice and to send enough heat above the airport to dispel the thickest fog.

Similarly, it will be possible for cities to lay networks of steampipes in the streets so that winter snows can be melted as fast as they fall. A traffic jam due to icy streets will be unknown in the era of atomic energy.

Controlling the weather around a baseball diamond or in a football stadium should not prove any more difficult. Steampipes, of course, would be the answer to the temperature. Driving rain away is a more difficult problem but

with the order of energy at the disposal of engineers the problem appears to be merely one of detail.

Ever-Present Sunshine.

I am not, of course, suggesting that it would be possible to chase a rainstorm away from a city but only that it would be possible to deflect it from a comparatively small area like a football stadium.

However, sunshine will be available in any given area, such as a park or bathing beach, irrespective of whether the sky is full of clouds or not.

Beyond a doubt, the era of atomic energy will see artificial



Smudge pots burning in an orchard to keep fruit from frost-bite—one of earliest methods of controlling weather.

suns mounted on tall steel towers. Such an installation would consist merely of a tall tower surmounted by a platform on which there was a great globe containing some uranium-235 at its center.

This would give off light and ultraviolet light equivalent to sunlight because the sub-atomic process by which uranium-235 releases energy is comparable to the process that goes on within the sun itself.

Similar artificial suns would make indoor farms a possibility.

Readers will recall that in the case of the bomb test in New Mexico and the dropping of the bombs on Hiroshima and Nagasaki, observers remarked upon the blinding flash of light. The light would be released gradually by the artificial suns on the steel towers.

Trigger a Secret.

The globes of such artificial suns, however, will have to screen out the lethal rays produced by the disintegration of the uranium-235 for otherwise these would be as deadly as the rays of radium.

It is obvious, of course, that every device that utilizes atomic energy will have to be designed with this point in view.

It was first suggested when the original work with uranium-235 was made public, prior to Pearl Harbor, that the easiest way to use it would be merely to drop it in a boiler of water. Just as radium gives off energy, so it would give off greater amounts of energy and the result would be the generation of steam.

Such a boiler, however, would have to be encased in a lead-lined

jacket to protect people from the rays that might otherwise come through it from the uranium-235.

It is obvious, however, that as time goes on other ways of utilizing atomic energy will be developed. There is no reason why an internal combustion engine cannot be developed in which tiny explosions of uranium-235 run the engine.

Gasoline engines run today on such tiny explosions of gasoline. That is the difference between the way the gasoline behaves in your engine and the way it behaves when some moron looks into the gas tank with the aid of a lighted match.

The bomb on Hiroshima let go all at once. An internal combustion engine would require a series of controlled explosions.

In developing the bomb scientists had to develop a way of causing the uranium-235 to let go all at once. There has been no indication from President Truman or the War Department as to how that was accomplished.

Returning to the utilization of atomic energy, I believe the reader can think of many uses that I have not mentioned. But it is important to remember that the controlling factors in the use of this new energy is not merely the stupendous power but the small amount of material needed to deliver it.

Twenty-million pounds of coal is 10,000 tons. It would take a lot of freight cars to carry that much coal. But a pound of uranium-235 could be transported on a kiddie car.

TOMORROW: What is atomic energy?

Era of ATOMIC ENERGY



Mme. Marie Curie—got radium from pitchblende.

Bomb Blasts Chemistry Law to Bits

Third of a Series.
By DAVID DIETZ,

Scripps-Howard Science Editor.

The release of atomic energy involves the literal annihilation of matter. To the student of science that is more amazing than any of the wonders that may be expected from the application of atomic power to the post-war world.

It is important to understand this point because it not only means that we must completely change our notions about the basic structure of the universe but it means also that the next 50 years may bring discoveries and developments so amazing that we do not now even have an inkling of what their character might be.

You perhaps remember learning back in your chemistry class a "law" called the "law of the conservation of matter." You were taught that it was possible to change the form of matter but not to destroy it.

Clew Found in 1896.

For example, if you burned a lump of coal it disappeared. But what happened was that the coal united with the oxygen of the air and what was originally coal and oxygen now existed in the form of ashes and the gases of combustion.

But when atomic energy is released some of the particles that composed the original atoms are not merely changed in form. They literally go out of existence. They are completely transformed into energy.

Atomic energy is energy released by the disintegration of atoms of matter. Its existence was first disclosed to the world in 1896 when the French physicist, Prof. Antoine Henri Becquerel, discovered that uranium gave off mysterious rays like the X-rays discovered the previous year by Prof. Wilhelm Konrad Roentgen of Germany. Two years after Becquerel's discovery, in the year 1898, Pierre and Marie Curie discovered radium.



A game which demonstrates how the heart of the atom is smashed by particles shot into it from the outside.

Science Service Photo.

Researches conducted in the early years of the 20th century revealed that the energy released by radium consisted of rays of a number of kinds. Some were pure rays of energy like those given off by the X-ray tube, but others were subatomic particles. In time it became known that the atom of radium was disintegrating and that it was the breaking up of the atom that released the energy.

You will recall, however, the story of the research for radium conducted by the Curies. From a ton of the mineral known as pitchblende they finally obtained, by months of work a fraction of a grain of radium.

That is why radium has remained so expensive. It has continued to be difficult to obtain much of it and the process for extracting it from its ores has remained complicated and expensive.

Atom Smashing Is Born.

Almost at the start of the present century, physicists began to ask themselves this question: If radium is constantly disintegrating, giving off the energy that is locked within its atoms, why shouldn't it be possible to cause us to give up energy? Why not release the energy within the atoms of water, for example?

Thus was born the researches that in later years became known as "atom smashing."

Dr. J. R. Oppenheimer, the brilliant professor of physics of the University of California, who planned, organized and directed the scientific research that went

into the new atomic energy bomb, has been called "a second Einstein."

The title is good, not only because Oppenheimer's work showed true genius, but because in more ways than one the atomic energy bomb began with Prof. Albert Einstein.

It was in 1905 that Einstein gave the world the concept that matter and energy were interchangeable, that one could be converted into the other.

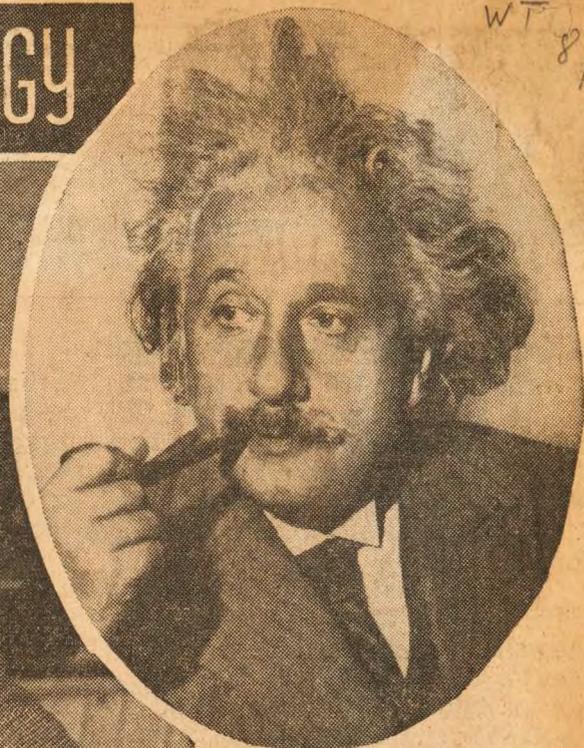
An Energetic Period.

More than that, he wrote the equation for the transformation and showed that a very little matter would produce a vast amount of energy because the equation said that the energy produced would be equal to the mass involved multiplied by the square of the velocity of light.

The velocity of light is a very big figure—186,000 miles a second—and when you change that to centimeters per second and square that you get a still bigger figure. That explained why the annihilation of a subatomic particle so small that half a million of them might rest on a period at the end of this sentence, might still produce a tremendous amount of energy.

Einstein's equation showed that if you convert all the atoms of a glass of water into energy you would get enough energy to drive an ocean liner across the Atlantic.

The amazing thing about all this is that exactly 25 years later, in the famous Cavendish Laboratory of the University of Cambridge, England, two physicists



Prof. Albert Einstein—discovered matter and energy were interchangeable.

tremendous and almost unbelievable amount of energy. Whereas the radium atom merely expels a particle or two from the nucleus, the atom of uranium 235 splits in two.

Uranium Expensive.

But this was the problem as it stood in 1940: To separate uranium from its ores was almost as difficult as to separate radium. But after you got the uranium you still had to separate the atoms that compose uranium 235 from the rest of the uranium, which is uranium 238. These numbers refer to atomic weights on a scale which has oxygen, with an atomic weight of 16, as the standard.

In 1940 there was a tiny amount of uranium 235 at Columbia University, about a millionth of a gram. It had been separated from ordinary uranium by scientists of the General Electric laboratories.

The G. E. experts said that it had taken 100 hours to separate that amount of uranium 235 from a sample of ordinary uranium.

The problem which had to be solved by our scientists in the war was how to speed up the process of concentrating uranium 235.

Obviously, one way of doing it was to build huge plants in which the necessary units for the separation are duplicated hundreds of times. I imagine, although I don't know, that this was done and that this accounts for the tremendous size of the plants at which the atomic bombs are made.

But it should be equally obvious that while you can do things this way in a war you can't run a peacetime economy that way. For the peacetime world uranium 235 is no solution of the power problem unless it can be produced cheaply.

I would say, therefore, that the arrival of the era of atomic energy depends upon two things: First, it depends upon how soon the world can produce uranium 235 at a cost that is not prohibitive in peacetime.

Secondly, how soon the scientists can solve their original quest, how to get the energy out of the atoms of any chemical element, not merely this scarce and hard-to-concentrate uranium 235.

Tomorrow—How soon will the Era of Atomic Energy arrive?



Dr. J. R. Oppenheimer—"a second Einstein."

working under the direction of the famous Lord Rutherford succeeded in bringing about the head-on collision of a positive and a negative electron. The two particles were completely annihilated and the energy produced by the annihilation was precisely the amount called for by Einstein's equation.

The advances that came in our knowledge of the atom between 1930 and 1940 were due to the building of bigger and bigger machines for tearing atoms apart. Chief among these were the cyclotrons.

But while they gave us a vast amount of new knowledge about the structure and behavior of atomic nuclei, they brought us no nearer the solution of the problem of how to release the energy of the atoms of ordinary matter on a wholesale scale.

Atom smashing took a new turn in 1940 with the sudden discovery that one form of uranium, known as uranium 235, would release a

N.Y.T. 8/19
EIGHTEEN FATEFUL DAYS

The first eighteen days of August, 1945, can be set down as the most nerve-racking in modern history. Whether they are also the most auspicious depends on what we do with their results. So fast have events moved that the situation of three weeks ago seems like ancient history. First, on Aug. 2, we had the Potsdam communiqué, with its hopeful promise of the restoration of democracy and civil liberties in Europe and its practical economic and political proposals, not all of which could be accepted without reservations.

Second, on Aug. 6, we had the announcement of the first atomic bomb. One could accept this horrible weapon because it would shorten a bloody war and because the knowledge on which it was based might some day ease the burdens of all humanity. But the indiscriminate slaughter which it caused did not lie easily on American consciences, and the problem of its future control was, and is, appalling.

Third, on Aug. 8, Russia made her long-expected declaration of war and immediately moved into Manchuria. Her swift gains confirmed other evidences of Japanese weakness and the surrender offer of Aug. 10 was not a surprise. The surprise—and the nervous strain—lay in the arrogance, the defiant propaganda and the unaccountable delays which characterized the last days and hours of the Japanese Empire.

The jubilant and in some cities riotous celebrations of the coming of peace will cause Tuesday and Wednesday of last week to be long remembered. Less dramatic were the quiet people, probably all over the country, who came out to their front porches to breathe the air of peace again, or offered up prayers in their homes or in their churches, or felt in their hearts, as so many millions of wives and parents must have done, a thankfulness too deep for words. Not since the ending of the war of 1861-65 has this nation been through such a moving experience.

Yet there was evident, both in the noisy celebrations and in the quietness that followed, an element of apprehension as to the future. The goal toward which free humanity had been struggling for so long, at such terrible cost, had at last been attained, but with it there came a realization of the nature of victory in war. Victory is a negative thing at best. It merely ends the dangers and horrors of war. It does not give back the lives that were lost, or restore those that were broken, or re-establish the conditions that existed before war broke out. It does not, in itself, establish a lasting peace.

The morning after victory must, therefore, be sober indeed. New problems rise. In our own country we face immediately the tremendous task of turning our production from war to peace. No war worker could wish to keep his job at the expense of other people's lives, yet he cannot help concern as to his personal future. Most soldiers, sailors and marines want their discharges at the earliest possible moment, but now they must ask themselves what are their opportunities in civilian life.

In the countries which have borne the brunt of battle, from Russia, France and the Balkans to China, the immediate outlook is worse. Security and prosperity are plants that grow very slowly amid the ruins. Liberty is sweet, but it is not food, clothing, fuel and shelter. It will in time produce them or all our hopes are vain, but the time is necessary and there are countless millions who will find it hard to wait.

Thus these days of new-born peace are also days of crisis. We have to see that relief goes swiftly to those who need it most, at home and abroad. We have to see that economic and political reconstruction is of such a sort as to perpetuate peace. In the light that glared over Hiroshima and Nagasaki we have to reconsider the

obligations assumed under the United Nations Charter, and ask ourselves whether we have gone far enough in the new machinery for the amicable settlement of international disputes. Two atomic explosions have been sufficient to make peace more than a desirable objective. It is now a necessity to the survival of civilization.

Much of the burden of the new tasks imposed on humanity by these fateful days of August, 1945, rests upon the United States. We have become the most powerful nation in the world. Five years ago honest, if mistaken, Americans could talk of a policy of isolation. Now we are the center and focus of a new fear and a new hope. And a center cannot be isolated.

THE LESSON OF THE BOMB

Now that we have Prof. H. D. Smyth's report on the atomic bomb we are more deeply impressed than ever with the immense amount of research that had to be conducted before we were able to inflict upon Japan two blows of such explosive violence that the reverberations are still rolling around the world. The Western democracies at least have been rudely awakened to what the "social impact" of science means. Books enough have been written on that subject, but it took the bomb to make us realize that the discussions were not just academic. Though it is not likely that Great Britain and the United States will monopolize the secrets that Professor Smyth was not permitted to disclose, it is well to have the lesson driven home that the physicist who tries to find out how matter is put together and who even puts it together in new ways, which is what happened in the case of the artificial elements neptunium and plutonium, can be the most dangerous man on earth in war and the most useful in peace.

Professor Smyth presents us with the dramatic spectacle of scientists of many nationalities and differing religious beliefs uniting in a common cause. Even in peace scientists met in international conventions, accepted one another for what they were, gave their findings freely to the world and rarely asked for patents. This time they were organized to solve an urgent problem. They solved it not in the fifty years expected before the war but in three, and they solved it so rapidly because they were organized and competently directed. Why should not the same principle be followed in peace?

There are enormous gaps in our knowledge that need to be filled. It is little short of a disgrace that after centuries we are no nearer to the conquest of cancer, arthritis, heart failure and the degenerative diseases. It is a disgrace that millions of chemical compounds remain to be discovered—compounds of which many will be of immense importance. It is a disgrace that we cannot predict what the weather will be a fortnight hence in Chicago or New York. It is a disgrace that we have only the vaguest notion of what happens to a piece of beefsteak after it is eaten. There are thousands of such scientific disgraces for which we must blame our niggardliness and our blindness and not the scientists. After what was done by cooperation in the case of the bomb, who can doubt that if research were internationally organized by a new League of Nations many of these disgraces would give place to triumphs? If other nations develop their own bombs, which seems likely whether we manage to keep ours secret or not, we can at least learn the lesson of international cooperation in science from the physicists to whom Professor Smyth pays tribute.

THE NEW Y

The Consolidated 37, a 320,000-pound giant with six engines, will have a cruising speed above 340 miles an hour and carry 204 passengers.

Wartime skills and advances in radar and other electronic aids are expected to make all these planes far more independent of weather, both aloft and at landing grounds, than ever before and capable of still better records of safety and dependability than those which have brought so much credit to air transportation in the war emergency.

N.Y. Times 8/18
DURING our vigil with the beans, we thought back over the whole long war, trying to remember the terrible distances and the terrible decisions, the setbacks, the filth and the horror, the bugs, the open wounds, the fellows on the flight decks and on the beaches and in the huts and holes, the resolution and the extra bravery—and all for what? Why, for liberty. "Liberty, the first of blessings, the aspiration of every human soul . . . every abridgment of it demands an excuse, and the only good excuse is the necessity of preserving it. Whatever tends to preserve this is right, all else is wrong." And we tried to imagine what it will mean to a soldier, having gone out to fight a war to preserve the world as he knew it, now to return to a world he never dreamt about, a world of atomic designs and portents. Some say this is the beginning of a great time of peace and plenty, because atomic energy is so fearsome no nation will dare unleash it. The argument is fragile. One nation (our own) has already dared take the atom off its leash, has dared crowd its luck, and not for the purpose of conquering the world, merely to preserve liberty.

IN England the other day a philosopher and a crystallographer held a debate. The question was whether a halt should be called on science. The discussion was academic, since there is no possibility of doing any such thing. Nevertheless, it was a nice debate. Professor Bernal, the crystallographer, argued that children should be allowed to play with dangerous toys in order that they may learn to use them properly. Joad, the philosopher, said no—science changes our environment faster than we have the ability to adjust ourselves to it.

The words were hardly out of his mouth when a blind girl in Albuquerque,



noticing a strange brightness in the room, looked up and said, "What was that?" A bomb had exploded a hundred and twenty miles away in the New Mexican desert. And people all over the world were soon to be adjusting themselves to their new environment. For the first time in our lives, we can feel the disturbing vibrations of complete human readjustment. Usually the vibrations are so faint as to go unnoticed. This time, they are so strong that even the ending of a war is overshadowed. Today it is not so much the fact of the end of a war which engages us. It is the limitless power of the victor. The quest for a substitute for God ended suddenly. The substitute turned up. And who do you suppose it was? It was man himself, stealing God's stuff.

WE have often complained on this page that the political plans for the new world, as shaped by statesmen, are not fantastic enough. We repeat the complaint. The only conceivable way to catch up with atomic energy is with political energy directed to a universal structure. The preparations made at San Francisco for a security league of sovereign nations to prevent aggression now seem like the preparations some little girls might make for a lawn party as a thunderhead gathers just beyond the garden gate. The lemonade will be spiked by lightning. The little girls will be dispersed.

Nuclear energy and foreign policy cannot coexist on the planet. The more deep the secret, the greater the determination of every nation to discover and exploit it. Nuclear energy insists on global government, on law, on order, and on the willingness of the community to take the responsibility for the acts of the individual. And to what end? Why, for liberty, first of blessings. Soldier, we await you, and if the place looks unfamiliar, forgive us. We shall try to restore certain characteristics we all love. Please bear in mind that there is a brightness in the room. Even the blind can detect it.

Era of ATOMIC ENERGY

New Bomb May Force Universal Peace at Last

Last of a Series. VT. 8/20

By DAVID DIETZ,
Scripps-Howard Science Editor.

Universal and perpetual peace, in my opinion, will reign in the era of atomic energy for three reasons. They are quickly stated.

First—With energy as abundant as the air we breathe, there will be no longer any reason to fight for oil or coal.

Second—By using atomic energy to mine the ocean for its vast mineral content every nation will be able to obtain easily all the raw materials that it needs. There will be no such thing as a division of the world, on the basis of mineral resources, into the "have" and the "have-not" nations.

Third—As we already see from the atomic energy bombs that dropped on Japan, war has become so destructive that no nation will dare begin a war, since it will mean the mutual destruction of every nation and the end of civilization.

With atomic energy bombs in existence, mankind has now arrived at the crossroads where he will have to choose between peace and the total destruction of civilization.

At the present moment the secret of the atomic energy bomb is known only to a handful of scientists, chiefly American and British, although two of the key people in the project were Dr. Neils Bohr, a Danish physicist, and Dr. Enrico Fermi, both Nobel Prize winners and both in this country.

Germans Were on Trail.

But we do know that the German physicists were working on this problem and we have President Truman's word for it that we were in a race with the Nazis in this project. By the grace of God, as Mr. Churchill observed, we won that race.

By putting our top scientists to work on the problem with a budget of \$2,000,000,000 and the resources of such companies as General Electric, Westinghouse, du Pont and others, we got the jump on the rest of the world. In time the rest of the world will catch up.

A question that I am certain is in the minds of most readers is how soon this era of atomic energy that I have been talking about will arrive. Will it come in the next few months? Will it take five years to arrive or 50?

Back in 1940 I was saying that we might expect the era of atomic energy to arrive sometime in the next half century. I am inclined now to cut that estimate to 10 to 25 years, and at the moment I am sufficiently optimistic to say that it may prove to be closer to 10 than 25.

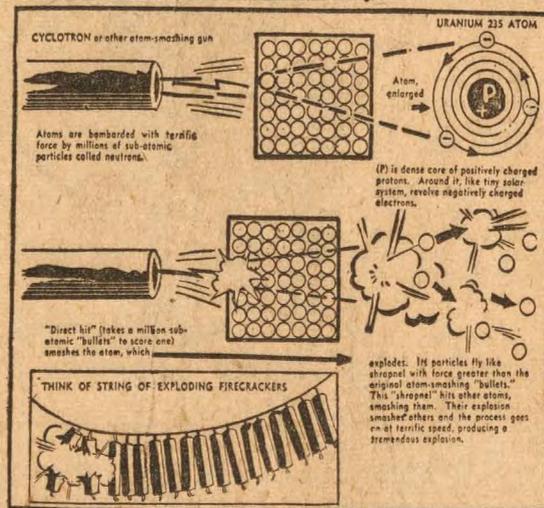
Depends on U. S.

However, it depends entirely upon us—the citizens of the United States. It depends upon what we do about encouraging and financing the scientific research needed to transform the new destructive weapon of war into the tool of industry and transportation.

The University of Chicago has taken a step which should point the way for the rest of the nation. It announced that the kinds of research which had led to the invention of the atomic energy bomb would be continued at the University of Chicago and that to this end a new institute was being created on the university campus.

To be known as the Institute of Nuclear Studies, the new institute will be headed by Dr. Samuel K. Allison, professor of physics in the university.

Joining the institute are two others: Dr. Fermi, self-exiled Italian physicist who discovered artificial radioactivity, and Dr. Harold C. Urey, Columbia University chemist who discovered double weight hydrogen and "heavy water."



How atomic energy is released.

obtain a direct hit on one atomic nucleus.

But the whole picture was changed by Dr. Fermi, who found that what was needed was a particular kind of subatomic projectile.

Instead of the high-speed electrified particles from radium that Lord Rutherford and the others had used, the proper projectile was a slow speed neutral particle. It was Prof. Fermi who first employed that particle, now known to physicists as "the slow neutron."

With the slow neutron, Fermi got a direct hit on an atomic nuclei every time. It was the use of the slow neutron that made possible the release of atomic energy from uranium-235.

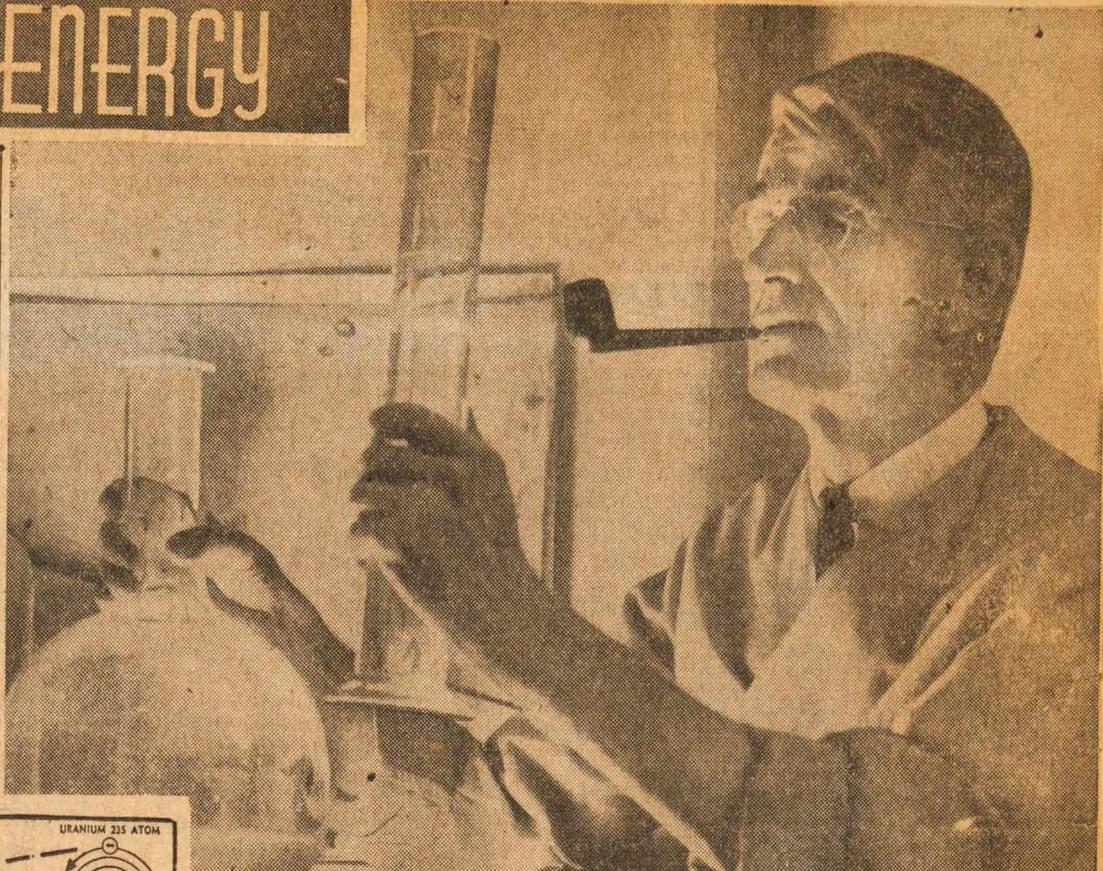
When a slow neutron hits an atom of uranium-235, the atom breaks in two, releasing a tremendous amount of energy and another slow neutron which sets off the next atom, thus starting the chain or "firecracker" reaction.

I have dwelt at some length on

Picture Changed by Fermi

The great difficulty in the early days of atom-smashing was to deliver a direct hit on the nucleus.

Lord Rutherford, pioneer in atom-smashing in 1919, found that he had to shoot a million subatomic particles released from radium to



Above, Dr. Vannevar Bush, one of the foremost of government scientists, who urges creation of a national research foundation to further atomic energy study.



Dr. Enrico Fermi — employed the slow neutron.



Dr. Harold C. Urey—discovered double weight hydrogen and "heavy water."

Science Points Way.

For instance, just a few weeks before the first atomic energy bomb fell on Japan, Dr. Vannevar Bush, director of the Office of Scientific Research and Development, presented to President Truman his report on postwar scientific research.

Dr. Bush urged the creation of a National Research Foundation by Congress. Through such a foundation he looks forward to maintaining for the nation the benefits of accelerated scientific research such as were enjoyed during the war.

The new National Research

Foundation would function by making contracts with laboratories of schools, universities, research institutions, industrial concerns, etc., for research on specified problems.

During the war the Office of Scientific Research and Development functioned on this basis. More than 3000 such contracts were made with more than 300 laboratories. Some 7000 scientists worked on these contracts.

Out of them came not only information needed for the atomic energy bomb but other important advances that played their part in the electrical gun-pointer, submarine detection apparatus, etc.

The program suggested by Dr. Bush is very modest indeed when compared with the two billion dollars spent on the atomic energy

bomb. He would have Congress make available a budget of some \$10,000,000 a year for basic research in physics, chemistry, biology, etc., and another \$5,000,000 a year for medical research.

Eventually this would be stepped up to \$50,000,000 a year for basic scientific research and \$20,000,000 a year for medical research.

With the knowledge of the atomic energy bomb before us, many persons will wonder if this is enough. Perhaps Congress should spend \$10,000,000 a year on that subject alone.

What the United States, Great Britain and Canada do not have is a perpetual monopoly on the present knowledge of atomic energy. It is merely a head start. Others will catch up in time. That is why we cannot afford to stand still.

The Atom Engine: How Soon Will It Be?

It may take fifty years to harness atomic energy and put it to work for man's benefit.

By WALDEMAR KAEMPFERT

A FORTNIGHT has elapsed since the first atomic bomb devastated Hiroshima. The world is still stunned by the news. The promise of atomic energy serving mankind on a scale and with an efficiency that dwarfs anything ever attempted with the familiar forms of mechanical and electrical energy is held out. But only a promise. So far we have only a terrifying bomb, and a bomb is not a contrivance with which we can produce goods, light cities and drive railway trains. Questions arise. What form will the atomic engines of the future assume? When may we expect them to turn machinery?

Before we attempt to answer, it must be borne in mind that thus far only from the most easily mastered radioactive element has energy been liberated in amounts that demand engineering attention. What of such light, common, unexciting elements as silicon, carbon, iron and such gases as hydrogen and oxygen, or, for that matter, of such plentiful and familiar compounds as water? Long before the atomic bomb was dropped we were assured that matter does not have to be radioactive to give up energy—that if we can annihilate any of the ninety-two kinds of atoms we shall have all that we need and more. So we have to consider not only the immediate future, when a few radioactive materials alone will be used, but the remoter future when a handful of clay will produce far more power than a million tons of coal.

AT the outset we must bear in mind that until 1939 all the attempts to break up any atom by powerful blows delivered by fast projectiles had come to little. More energy was put into the atom than came out. In that fateful year 1939 the first practical step was taken which may give us an atomic engine. Drs. Otto Hahn, E. Strassmann and Lise Meitner bombarded uranium with neutrons. They were not thinking of power. The neutron offered the only chance of breaking up uranium, a naturally unstable element.

They found that when a neutron with so little as one-thirtieth of a volt struck the nucleus of a uranium atom out shot 200,000,000 volts—six billion times as much energy as had been put in. Moreover, the atom ceased to be uranium. It had been split in two parts—one barium and one krypton. So we had not only transmutation, no new phenomenon, but the release of energy, which was new, so far as the enormity of the amount was concerned.

The rest of the story we know. What Secretary Stimson calls an international "battle of the laboratories" began. It might have been won by Germany if her industrial plants and her laboratories had not been bombed. Actually it was won by scientists who were chiefly American and British, but among whom were also Niels Bohr, a Dane; Enrico Fermi, an Italian exile; and refugees of other nationalities.

There never was such an organization as this. In three years the best brains in the world produced a bomb, the explosion of which is still reverberating around the world.

Since that bomb is loaded with either one or two rare forms of uranium we have to consider atomic engines of the near future in the terms of that element. Before we can have an engine we must make sure of our raw material. This is uranium oxide found in two ores—pitchblende and carnotite.

PITCHBLENDE, a bluish ore, occurs in Connecticut, North Carolina, Texas, Canada, Great Britain, Austria, Czechoslovakia, Russia, Sweden and Norway; carnotite, a yellowish material, is found in Australia, Portugal and Africa. How much of either ore there may be in the world no geologist can state. Only a few surveys of known deposits have been made. Probably much pitchblende and carnotite have not yet been discovered.

Ores that had but few industrial uses before the war are destined to rank with coal, oil and iron. To Richard the Lionheart, coal was no more than a household fuel; to Napoleon, rubber was only a curiosity. After the steam engine, coal was worth fighting for. So with oil after the internal combustion engine. Will atomic energy repeat history? Will pitchblende and carnotite suddenly give the jungles of Africa the same economic and military importance as the oil of Iran and Iraq which is already coveted by every great power in the world? Possibly.

Secretary Stimson has stated that in developing the atomic bomb we saw to it that there would be no shortage of uranium ore. It is significant that in 1938 we imported 376,708 pounds of uranium oxide, raw material of all the uranums, with a value of \$520,540, that in the fateful year 1939, after Hahn, Strassmann and Meitner published their discovery, our importations shot up to 1,439,324 pounds, and that in January, 1943, the use of uranium as a colorant in ceramics was prohibited because research on the bomb was at its height.

AT the outbreak of war uranium oxide, 98 per cent pure, was worth about \$2 a pound, or about as much as a ton of coal at the mine. In terms of dollars the energy of uranium was worth 8.5 times that of coal. Now that uranium oxide has become an essential military material these money ratios no longer hold good. Shortly before the outbreak of war, Dr. R. B. Roberts of the Carnegie Institution of Washington, and Dr. J. B. H. Kuper of the Washington Biophysical Institute made some calculations which convinced them that if atomic energy is ever to take the place of the 500,000,000 tons of coal annually consumed by this country in peacetime, the utilization of uranium would increase 15,000 per cent. The price of ore is therefore bound to rise to a point just below (Continued on Page 36)

—THE ATOMIC AGE

Pleasant it is, after the shock and the awe of the first cosmic bomb has subsided a bit, to look ahead to the blessings the atomic age will bring. No more worry about John L. Lewis and frozen radiators. No more mile-long coal trains to wait for at the grade crossings when we go riding in our little new Uranium Eight. No more soot on our noses. No more smoke clouds blanketing city skies from the sunlight. . . . But here we drift into thinking of Hiroshima and Nagasaki, and that isn't so pleasant.

N.Y. Times 8/19

The Atom Engine?

(Continued from Page 11)

that at which coal and oil are still worth considering as sources of energy.

Next comes the matter of extracting and refining U-235. Before the war the known processes were so slow and expensive that it would have taken 75,000 years to obtain only a pound of pure U-235, and according to unofficial estimates the bomb contains from eleven to twenty pounds of some form of uranium. It is likely that in three years the pre-war process of concentration was accelerated thousands of times.

THERE is good reason to believe that uranium 235 does not have to be pure and that a concentration of 5 or 10 per cent would be more than enough to blow up a city, blast a subway, or run a railway train. Some physicists assert that much less is enough. If so, the problem of concentration presented no such research difficulties as were pictured at first.

More is involved in producing the bomb than concentration. In a highly technical report, which was issued a week ago with the consent of the War Department by Prof. H. D. Smyth of Princeton, a physicist who acted as consultant to the mysterious "Manhattan Engineering District" where the bomb was developed, it is indicated that first uranium 235 is bombarded, which then shoots out neutrons from its own nucleus and splits. These by-product neutrons are then trained on a mass which consists largely of the common 238. Thus U-238 is converted in 239. Both U-235 and U-239 can be used with explosive effect and hence for the generation of energy.

At this point Professor Smyth drops the curtain, but we cannot escape the conclusion that the physicists responsible for the bomb concentrated enough U-238 and then put radioactivity to work to obtain all the explosive material they needed.

WHAT is the cost of this process? We cannot even guess. The question is all-important to the practical business man, for he must know the answer if atomic energy is to be used for any purpose but that of waging war. We do not even know how much of the two billion dollars that the bomb has cost up to June 30, 1945, was expended on research and development and how much on the construction of two colossal plants in Tennessee and Washington. Nor do we know the monthly or yearly output of bombs. Even if the cost of partially refined U-235 or U-239 is at present too high for the financial angels of a new industry, we may be sure that it will decline. It has always been thus.

(Continued on Page 37)

The Atom Engine: How Soon?

(Continued from Page 36)

Once fifteen pounds of coal had to be burned to generate a horsepower in an hour with the first steam engine; now anything more than a pound is considered inefficient. Once aluminum cost as much as gold; now twenty-two cents a pound is considered right.

ASSUMING, then, that the engineers will improve their methods, what may we expect of atomic power within the next twenty-five years? How will our factory machinery differ from that with which we are familiar? The answers to such questions are not difficult, if we limit our forecast to the next twenty, thirty or fifty years.

Whether we generate energy by burning coal or oil under a boiler or whether we drive electrical machinery in a hydro-electric plant we always use heat in the last analysis. It is the heat in coal that is converted into mechanical or electrical energy. It is the heat of the sun that evaporates water from the ocean and lifts it into the atmosphere to form clouds from which it drops as rain to fill a lake or to pour down in a waterfall that can turn turbines. And it is the heat generated in exploding uranium or any other suitable element that will turn the wheels of the near future. In the beginning we shall do no more than substitute the heat of terrific explosions for the heat of combustion.

You may point to the automobile engine and say: "What about that? The mixture of gasoline vapor and air in the engine explodes, and a series of rapid explosions generates heat, which in turn makes the wheels go round." The analogy is faulty. Most explosions with which we have been familiar in practice are chemical explosions. That is, new chemical combinations are formed in the fraction of a second under the right conditions with the liberation of the expected heat. There is nothing chemical about the explosion of a uranium atom. Some matter is simply annihilated, and we still have to discover how to make the most of annihilation. An entirely new problem in engineering is presented.

Suppose that problem will be solved. At first exploding atoms under control will take the place of fuel. For many a year there will be no other change in power-plant machinery. Look about you fifty years hence and you will still see high-tension lines on steel towers, steam turbines, coffee percolators, washing machines and toasters, trolley cars and railway trains. Naturally, they will be improvements on ours, but the improvements will have come without benefit of exploding radium. Expect no revolution. Everything but the firebox of a boiler plant will be much the same in principle. Remember that in these first fifty years we shall still utilize heat as at present, and that in the beginning we can do no more than substitute for the familiar mode of generating energy by burning fuel the new mode based on the partial annihilation of uranium or some other form of not too expensive radioactive matter.

WHAT, then, will be the fate of the coal and oil companies? The substitution of atomic heat for the heat of burning coal and oil will be no economic calamity. There are still about 20,000,000 horses and other draft animals in this country, and these are bought and sold at good prices despite all the locomotives, trucks and tractors that have been introduced.

When the steam engine was intro-

duced engineers began to wonder if it was necessary first to boil water over a fire and then to pipe the steam under pressure to a steam engine. Why not use the heat directly in the engine and thus get rid of boilers and their accessories? Now we have internal combustion engines, of which those that drive our automobiles are examples. Will atomic engineering follow the same course? In other words, will it be possible to dispense with boilers and use the heat of exploding atoms directly in the cylinders of engines?

THERE is every reason to think so. Allowing from twenty to fifty years for inventors to give us first the method of firing a boiler with the explosions of uranium or some other radioactive element, we shall have to allow at least another twenty or thirty before exploding radioactive elements drive engines directly.

What form such an engine will assume we cannot even divine. The explosion of a few specks of uranium 235 or 239 would be enough to wreck not only any engine with which we are familiar but the whole building in which it is housed. Because of the bomb, because of our boundless faith in science, a faith justified by past achievements, atomic power in this form is bound to become a reality.

Up to this point we have considered only the radioactive elements as sources of power. What of the elements which are not radioactive? Annihilate the atoms of any of these and again we have power. It is hard even to wreck such atoms for the sake of the energy that they can emit. In fact, it has not yet been done.

Sir James Jeans tells us that if all the protons and electrons in a single drop of water could be made to annihilate each other the energy evolved would be sufficient to supply 200 horsepower for a year. There is enough energy in a visiting card to drive a ferry boat across the Hudson River for a year, enough in a puff of cigarette smoke to run a tractor for the same period, enough in a shovel of sand to run all the machinery of New York City for five years.

Even if the calculations prove to be anywhere from 10 to 50 per cent wrong, the amount of energy in ordinary matter is still staggering. The Ponce de Leons of the laboratory began the quest of this new power El Dorado before the last century, and the bomb is the first sign we have that they will ultimately exploit it. That quest may take two centuries.

IT is idle to speculate on the social changes that will occur if, a century or two hence, engineers in power-houses partially annihilate water, carbon or any other abundant and familiar form of matter as they now handle coal and oil. We have read enough of rocket ships driven by atomic power to the moon, of central stations that will light whole cities with the energy in water, of power so cheap that it will not pay to read meters, of the possibility that gold may be a by-product of atomic disintegration, a nuisance to be disposed of as we now dispose of ashes.

The point to be kept in mind is that this culture was created by the scientific use of energy. Up to the present we have been generating and utilizing energy in a crude way. A new era begins with a bomb. The steam engine, the gas engine, even the gas turbine are likely to seem as primitive to our descendants of the remote future as the inventions of savages seem to us.

Atomic Bomb Called Incapable Of Maintaining Peace by Itself

H. T. 8/20

3 Powers Holding Secret of Weapon Seen Aware They Can't Rule by Fear and That All Peoples Must Join to Assure Freedom From War

By Major George Fielding Eliot

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The foundation of modern war is of a dual nature. It consists of the twin cornerstones, the laboratory and the factory. The most advanced, diligent and versatile scientific research and development must go hand in hand with an industrial plant capable of transforming new discoveries into improved or wholly new weapons in sufficient quantity and without fatal delays.

We are discovering that if the Germans only had been able to give industrial expression, in time and in volume, to some of their discoveries, our victory might not have come so quickly. We entertain a shrewd suspicion that the Russians had to use quantity production, sheer weight of metal, in order to make up for a certain, though not total, lack of scientific techniques. Neither of our twin cornerstones can support the whole edifice of modern war-making power without the other. Any deficiency in one impairs the ability of the other to do its job.

Two Basic Elements

In order for these twin cornerstones to be constructed, and to be enlarged as may be necessary, there must be available in plentiful quantities the basic elements of which they are built. These basic elements are of two kinds: men and material. There must be raw materials of all sorts, including not only iron, coal, oil and such other staple commodities, but all the vast range of the incredibly variant requirements of modern industry and research. There must likewise be men; men in great numbers, trained men, men who have been educated in every branch of science, men possessed of every known skill and craft. From these elements, the twin cornerstones of war-making power may be constructed. If any necessary elements are not available, or are not in sufficient quantity, or are deficient in quality, then there will be delays or there will be a lack of efficiency in the result.

When you have examined these basic conditions you will perceive that of all the nations of the world, only the United States is completely and fully equipped to make war as far as the foundations of power are concerned. The Soviet Union may become so in another generation, but has not yet advanced far enough in the scientific, technical and educational field: there has not been time since the artificial darkness of serfdom and of Czarism was lifted from the land.

Meanwhile, it is the United States, in association with Great Britain and Canada, which has the atomic bomb; it is we who have the world-ranging air power; it is we who have worked out the techniques of the use of air-borne armies, of radar and of other military employments of electronics. The conclusion is inescapable that if the English-speaking powers desired to use their power ruthlessly, they could establish themselves as the lords of the world. None could say them nay; none could hope successfully to resist. Their bases girdle the globe. Their rocket-bearing or atom-bearing planes can reach the remotest corners of the earth, to be followed by their air-borne legions. No city that raised a banner of defiance could expect to exist for twenty-four hours.

But it is not so that free peo-

ples employ power when it is given temporarily into their hands. Instead, we are engaged in world-wide discussions looking to the establishment of a just and lasting peace for all peoples. We Americans initiated those discussions, and we carried them on long after we knew we had and could eventually use atomic power as a weapon. We know that we cannot, merely by power, bring about the conditions of assured peace which we seek. We know we cannot rule by fear as far as the majority of mankind are concerned, unless we are willing—which we are not—to use our power ruthlessly and arbitrarily just to enforce our will on others whether they like it or not. We know that the only enduring peace must be a peace in which all peoples will join, which they will support in mutual confidence and with mutual guaranties.

The development of modern weapons has, however, underlined the need for an acceleration of this process. In this period of building, swiftly but surely, the structure of a true and durable security, the fact of our possession of world-wide power lays upon us a heavier responsibility than rests upon the shoulders of any other people, a responsibility which we share with the other English-speaking states. The atomic bomb alone cannot, as Max Lerner seems to imagine, become the world's policeman; it is not a policeman at all in the proper sense, since it can rule only by fear—if applied, it destroys.

Not the Sole Law-Givers

Fear may be used properly as a restraint to prospective criminals, it is in part the basis of all penal law—but it is not the function of the English-speaking states to be the sole law-givers of the world, nor to hold the other nations in bondage. On the other hand there is, and reasonably enough, strong opposition to the giving up of the present advantages unless they can be replaced by something in which we can have equal or greater confidence.

It seems to me that this dilemma can be solved only by the abolition of secrets and of hiding places. It seems to me that now, while we and our immediate brethren retain this immense military superiority, is the time to press firmly and vigorously for the breaking down of every wall of censorship in all the world which artificially denies the common man access to the truth. No more political censorship, no more controlled press and radio, but free news everywhere, free circulation of newsmen, freedom of communication and of movement of human beings without police supervision save as may be necessary to keep the peace; that should be our policy. If we are to place our weapons and our techniques at the service of the United Nations—and morally we should—then as a practical matter let us use our present position to insist that there shall be no hidden corner in which the selfish or the desperate may contrive to turn these powers against us.

MONDAY, AUGUST

Atomics Seen Bringing World Unity or Suicide

Jr. Sprout, on First Princeton Radio Program, Agrees Secret Can't Be Long Kept

Release of atomic energy means that "we shall either have one world politically or we shall have no world at all," Dr. Harold H. Sprout, professor of politics at Princeton University, said yesterday. He and two other Princeton scientists who worked on the atomic bomb, speaking on the university's first radio program, agreed that the secret of atomic power cannot long be kept from other nations.

Terming it a weapon as powerful as all the military inventions since gunpowder multiplied by 1,000, Dr. Sprout declared that "the bomb that shattered Hiroshima pushed all the nations to the very edge of the abyss."

The bomb, he said, puts a "higher premium" on maintaining the solidarity of the United Nations. "Political isolation and 'no entangling alliances' in the future may mean simply freedom to commit national suicide," he asserted.

Dr. Henry DeW. Smyth, chairman of Princeton's department of physics and author of the official War Department report on the atomic bomb, took part in the broadcast at 2:00 p. m. over Station WPAT, Paterson, N. J. Others on the program, first of a Sunday afternoon series called the Princeton University Preceptorial of the Air, were Dr. Hugh S. Taylor, chairman of the department of chemistry, and Dr. N. H. Furman, professor of chemistry, both of whom worked on the atomic project, and Professor Roy D. Welch, chairman of the section of music, moderator.

Dr. Smyth, as a citizen as well as a scientist, believes, he said, that the atomic bomb outlaws the

old prejudices of nation, class and race. "If this involves new social and political methods and ideas, we must not be afraid to try them," he added. "If men working together can solve the mysteries of the universe, they can also solve problems of human relations on this planet."

Dr. Taylor, confirming that atomic explosives can possibly be used in rocket bombs guided to their targets by television and radar, said also that, more important, "it is not hard to visualize the development of power plants in which nuclear fission will provide the energy." Radio-active substances produced as by-products of atomic fission may have medical uses, he declared. One industrial organization, he said, already has put "\$1,000,000 at the disposal of its research director for the discovery of applications of the new force.

Although members of the faculty have broadcast as individuals and athletic events have been reported play-by-play, yesterday's program, according to Alexander Leitch, Secretary of the University, was Princeton's first as an institution. The scene was the Woodrow Wilson Study on the campus.

H.T. 8/20
**Atom Bombing
'An Atrocity,'
Churchmen Say**

**Protest Use of Weapon as
'New Low in Inhumanity'
and Ask It Be Outlawed**

A statement protesting use of the atomic bomb at Hiroshima and Nagasaki as "reckless and irresponsible" and "a new low in inhumanity" was sent to President Truman yesterday by a group of churchmen and educators who asked him to "press for commitments by all nations outlawing the atomic bomb and also war, which has developed the technology of mass destruction."

"We believe we have committed an atrocity of a new magnitude," the statement said.

Pastors Among Signers

Among the thirty-four signers were New York pastors, including the Rev. Dr. George A. Buttrick, of the Madison Avenue Presbyterian Church; the Rev. Dr. Phillips Packer Elliott, of the First Presbyterian Church, Brooklyn; John Haynes Holmes, of the Community Church of New York; the Rev. John Paul Jones, of the Union Church of Bay Ridge, Brooklyn, and the Rev. Dr. John Howland Lathrop, Church of the Saviour, Brooklyn.

"This new missile, of 2,000 times the magnitude of our attacks hitherto, was not used to save ourselves in the extremity of desperation," the statement asserted. "We cannot believe it was even essential to the defeat of Japan. Its reckless and irresponsible employment against an already beaten foe will have to receive judgment before God and the conscience of humankind. It has our unmitigated condemnation."

"We are grateful for the scientific achievement that lies behind this weapon, and we wish to see the new power reserved for constructive civilian uses. The spiritual nature of man is challenged to achieve this. But if we once legitimize use of the atomic bomb for enemy destruction no power can again bring this new death energy within bounds."

Ask End of Production

The statement also asked the President to take immediate steps for discontinuing production of atomic bombs.

Other signers included the Rev. Dr. J. Henry Carpenter, of the Brooklyn Church and Mission Federation; Oswald Garrison Villard, writer, and four members of the faculty at Union Theological Seminary; the Rev. Walter S. Davison, the Rev. Dr. Charles W. Iglehart, the Rev. Dr. Arthur L. Swift jr. and the Rev. Dr. Paul E. Scherer, former pastor of the Lutheran Church of the Holy Trinity.

W. Tel. 8/20

NE

**Atom Could Wind Up
Everything, Says Shaw**

By the Associated Press.

LONDON, Aug. 20. — George Bernard Shaw, in a letter to the Times of London, suggested today that "monkeying with the atom" may loose atomic energy which will explode the world into a cloud of stardust and cremate the inhabitants with instantaneous thoroughness.

"Like the sorcerer's apprentice, we may practice our magic without knowing how to stop it," Mr. Shaw wrote. However, he said, such an outcome "would end all our difficulties."

Mr. Shaw recalled astronomers' observations of stars "too small to be visible, which have suddenly burst and blown up, leaving nothing but a cloud of stardust called a nebula. Heat energy liberated in the explosion is beyond human comprehension."

"Apparently what has happened to these stars and may happen to this earth of ours," he reasoned, "is that the protons with their planetary electrons and the heavier planetary neutrons of which their matter is composed, have combined and produced a temperature at which the whole star has pulverized and evaporated, and its inhabitants, if any, have been cremated with instantaneous thoroughness."

"What we have just succeeded in doing at enormous expense is

making an ounce of uranium explode like the star.

"The process, no longer experimental, certainly will be cheapened, and at any moment heavier elements than uranium, as much more explosive than uranium as uranium is than gun powder, may be discovered.

"Finally, like the sorcerer's apprentice, we may practice our magic without knowing how to stop it, thus fulfilling the prophecy of Prospero. In view of our behavior recently, I cannot pretend to deprecate such a possibility, but I think it worth mentioning."

Prospero's prophecy, to which Mr. Shaw refers, may be the speech in Act IV, Scene 1, of "The Tempest," when Prospero says:

*" These our actors,
As I foretold you, were all spirits
and
Are melted into air, into thin air;
And, like the baseless fabric of this
vision,
The cloud-capp'd towers, the gorgeous
palaces,
The solemn temples, the great
globe itself,
Yea, all which it inherit, shall dis-
solve,
And, like this insubstantial page-
ant faded,
Leave not a rack behind. . . . "*

Herald Trib

8-21-45

**Shaw Envisions
Earth's Demise
As Flaming Star**

**Likens the Atomic Bomb to
Sorcerer's Magic, Which
Amateurs Can't Control**

From the Herald Tribune Bureau
Copyright, 1945, New York Tribune Inc.

LONDON, Aug. 20. — George Bernard Shaw believes that with the invention of the atomic bomb, what happens when astronomers suddenly see a new star flame and disappear may happen to the planet Earth. In a letter to "The Times" today he wrote:

"Now that we, the human race, have begun monkeying with the atom, may I point out one possible consequence that would end all our difficulties?"

"For some years past our too few astronomers have been reinforced by a body of amateurs whose main activity has been the watching and studying of the variable stars. They have been excited several times by the sudden flaming up of what they called a new star, though in fact it is an old star,

too small and cool to be visible, which has suddenly burst and blown up, leaving nothing but a cloud of stardust called a nebula. The heat energy liberated in the explosion is beyond human comprehension.

"Apparently what has happened to these stars, and may happen to this earth of ours, is that the protons with their planetary electrons and the heavier, planet-less neutrons of which their matter is composed have combined and produced a temperature at which the whole star has pulverized and evaporated, and its inhabitants, if any, have been cremated with an instantaneous thoroughness impossible at Golders Green.

"What we have just succeeded in doing at enormous expense is making an ounce of uranium explode like a star. The process, no longer experimental, will certainly be cheapened, and at any moment heavier elements than uranium, as much more explosive than uranium as uranium is than gun powder, may be discovered.

"Finally, like the sorcerer's apprentice, we may practice our magic without knowing how to stop it, thus fulfilling the prophecy of Prospero.

"In view of our behavior recently, I cannot pretend to deprecate such a possibility, but I think it is worth mentioning."

TRUMAN IS URGED TO BAR ATOM BOMB

Clergymen In Appeal Condemn the Weapon as 'Atrocity of New Magnitude'

OWN FUTURE FATE SEEN

Churchmen Ask That the New Power Be Saved for Civilian and Constructive Uses

Thirty-four clergymen sent to President Truman yesterday an appeal that he order immediate discontinuance of production of atomic bombs and that he seek commitments from all nations to outlaw not alone the newest weapon but war itself, which the joint statement described as having "developed the technology of mass destruction."

Condemning the atomic bomb as "an atrocity of a new magnitude," the statement asserted that the use by the United States of the weapon was even worse than had been our earlier "systematic wiping out of half a hundred Japanese cities" by ordinary bombing. The clergymen maintained that by these acts Americans had "descended step by step to an equally low level of moral culpability" with the Japanese whom we had condemned for the bombing of Chinese cities with their civilian populations.

The statement mentioned that its signers had repeatedly voiced condemnation of "obliteration aerial bombing."

Among the signers were John Haynes Holmes of the Community Church, the Rev. A. J. Muste, co-secretary of the Fellowship of Reconciliation, and the Rev. John Paul Jones of the Union Church of Bay Ridge, Brooklyn.

Doubt It Was Needed

Use by this country of the atomic bomb cannot be excused on the ground that it was to "save ourselves in an extremity of desperation," the statement said.

"We cannot believe it was even essential to the defeat of Japan," the churchmen continued. "Its reckless and irresponsible employment against an already virtually beaten foe will have to receive judgment before God and the conscience of humankind. It has our unmitigated condemnation."

"Our own future fate is involved in this wartime use of the atomic bomb. We agree with Hanson Baldwin's comment that we clinched victory in the Pacific, but we sowed the whirlwind. We may have to reap not only the whirlwind of revenge and retaliation at so colossal a crime as we have committed against other human beings by its indiscriminate use. This very missile may be the instrument of our own destruction as a nation."

"Our President gravely assures us that the new demon will be carefully kept in control. If this means that no one else will ever obtain the formula or another effective one, or will ever obtain a specimen bomb, or will ever be able to visit our shores with one in some future conflict, we must disagree. We have now brought forth the new weapon that the world has been seeking and yet dreading. Now we shall have to take the consequences."

The churchmen said they were "grateful for the scientific achievement" behind the atomic bomb and that they wished to see the new power "reserved for constructive civilian uses."

"The spiritual nature of man is challenged to achieve this," the statement concluded. "But, if once we legitimize use of the atomic bomb for enemy destruction, no power can again bring this new death-energy within bounds."

Signers of Statement

Others among the signers, who signed only as individuals, were:

Prof. Roland H. Bainton, Yale Divinity School.

The Rev. Dr. A. D. Beittel, president, Talladega College, Ala.

The Rev. Dr. George A. Buttrick, Madison Avenue Presbyterian Church.

Prof. Robert F. Calhoun, Yale Divinity School.

The Rev. Dr. J. Henry Carpenter, Brooklyn Church and Mission Federation.

Franklin D. Cogswell, secretary, Missionary Education Movement.

Rabbi Abraham Cronbach, Hebrew Union College, Cincinnati, Ohio.

Prof. Walter F. Davison, Union Theological Seminary.

The Rev. Dr. Phillips P. Elliott, First Presbyterian Church, Brooklyn.

Mary Farquharson, former member, Washington State Senate.

Prof. Charles Iglehart, Union Theological Seminary.

The Rev. Dr. E. Stanley Jones.

Prof. Rufus M. Jones.

The Rev. Dr. Samuel W. Marble, Trinity Methodist Church, Denver.

Alfred D. Moore, Foreign Missions Conference of North America.

The Rev. James Myers, Federal Council of Churches Industrial Department.

Kirby Page, La Habra, Calif.

Mrs. Henry Hill Pierce, secretary, Episcopal Pacifist Fellowship.

Clarence Pickett, executive secretary, American Friends service committee.

The Rev. Dr. Edwin McNeill Poteat, president, Colgate-Rochester Divinity School.

Dorothy M. Roberts; The Rev. Dr. John Nevin Sayre, co-secretary, Fellowship of Reconciliation.

The Rev. Dr. Paul E. Scherer, Lutheran Church of the Holy Trinity.

Prof. Walter W. Sikes, Berea College, Kentucky.

Prof. Arthur L. Swift Jr., Union Theological Seminary; The Rev. Dr. Winburn T. Thomas, Student Volunteer Movement.

The Rev. Dr. Ernest Fremont Tittle, First Methodist Church, Evanston; Oswald Garrison Villard; The Rev. Dr. Theodore D. Walsler, secretary, N. Y. Fellowship of Reconciliation, and E. Raymond Wilson, Friends Committee on National Legislation.

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TRUMAN IS URGED TO BAR ATOM BOMB

Continued From Page 21

be published tomorrow morning, warns that the ultimate consequence of exploding atoms may well be the explosion of the world.

"Now that we, the human race, have been monkeying with the atom," he writes, "may I point out one possible consequence that would end all our difficulties?"

"For some years past our too few professional astronomers have been reinforced by a body of amateurs whose main activity is the watching and study of variable stars.

"They have been excited several times by the sudden flaming up of what they call a new star, though it is, in fact, an old star too small and cool to be visible which has suddenly burst and blown up, leaving nothing but a cloud of star dust called a nebula. The heat energy liberated in the explosion is beyond human apprehension. * * *

"What we have just succeeded in doing, at enormous expense, is making an ounce of uranium explode like the star. The process, no longer experimental, will certainly be cheapened; and at any moment heavier elements than uranium, as much more explosive than uranium as uranium than gunpowder, may be discovered.

"Finally, like a sorcerer's apprentice, we may practice our magic without knowing how to stop it, thus fulfilling the prophecy of Prospero. In view of our behavior recently, I cannot pretend to deprecate such a possibility, but I think it is worth mentioning."

DOUBTS BOMB SECRECY

World Harmony Only Safeguard, Says One of Inventors

Special to THE NEW YORK TIMES.

PRINCETON, N. J., Aug. 19—Princeton University today celebrated the end of the war with a service of thanksgiving in the university chapel and with a broadcast on "The Age of Atomic Energy" by three of the Princeton scientists who contributed to the development of the atomic bomb.

In the broadcast, Princeton faculty members warned that cooperation among nations to preserve peace is now necessary in a world in which it is possible for any nation to discover the secret of making an atomic bomb.

"We believe it will be impossible to keep secret for long the method of making the atomic bomb," said Prof. Henry Dew Smyth, chairman of the Princeton Department of Physics, who is the author of the report on the project released by the War Department. "We know that our scientists are ordinary people, and we believe that other people in other parts of the world can eventually do what we have done.

"This is in truth one world," Professor Smyth added. "And to avoid annihilation we must together solve the problem of living at peace. If men, working together can solve the mysteries of the universe, they can also solve the problem of human relations on this planet."

Prof. Hugh S. Taylor, chairman of the Princeton Department of Chemistry, and Prof. N. Howell Furman also took part in the broadcast, the first in a series called "The Princeton Preceptorial of the Air" over Station WPAT, Paterson, N. J., every Sunday afternoon at 2 o'clock. Prof. Harold H. Sprout, political scientist, was the fourth member of the radio discussion group.

"If history teaches anything," said Professor Sprout, "it is that any prolonged attempt to keep the secret of atomic power away from other peoples can be expected to produce but one result: intensive research in the countries excluded from the secret, accompanied by fear and corroding resentment and distrust of those who already possess it. The alternative is clear. Either we shall have one world politically or we shall have no world at all.

Later in the afternoon townspeople, undergraduates and faculty members united in the service of thanksgiving in the university chapel, led by Dean Robert R. Wicks of the Princeton University chapel.

SHAW SOUNDS WARNING

Exploding Atoms May Well Mean World's End, Says Savant

By Wireless to THE NEW YORK TIMES.

LONDON, Aug. 19—George Bernard Shaw, in a letter to the editor of The Times of London, which will

Continued on Page 22, Column 2

Atom Bomb May Drive Industry Underground

Too many persons worked on the atomic bomb project for the United States and England to keep it secret for any length of time, Louis Bruchiss, armament expert, declared today. We, must, he added, begin now to prepare defenses against its possible use by future aggressor nations.

The solution he offers is for industry to go underground on an unprecedented scale never before envisioned even by Germany, which took its war works into the subterranean depths during World War II.

Mr. Bruchiss said in the office of Aerosphere at 370 Lexington Ave. that underground plants were the sole alternative, since it will be impossible for scientists to produce weapons that would be 100 per cent effective against the atomic bomb.

Work Abroad Recalled.

"Tens of thousands of persons were engaged in the atomic bomb project," he stated, "and it is known that many other countries were working on it before it was perfected by us."

"The atomic bomb is now known by its elements to a great many people. The composite information gives away its secret. Now that the war is over the people who worked on the atomic bomb are bound to talk. Other nations will go to great pains to get the information, legitimately or illegitimately. There is no doubt but that they will get it in time."

The scientist declared that a great deal about the atomic bomb was learned from its effects and from the type of plant in which it was made.

"All the information published prior to 1940 went into its making," he said in defense of his statement that it could not be kept secret. "Even without the war the atomic bomb would have been discovered in time."

Ground Resistance Cited.

Mr. Bruchiss said he based his suggestion that industry go underground on the fact that every force in nature seeks the path of least resistance.

He said that tests and results of the atomic bombs used on Japanese cities proved that its major effects were on the surface of the earth.

"The atomic bomb," he said, "blasted craters, but they were of no great importance. No projectile can penetrate the earth for any great distance. The earth has great resisting power. Great damage can be caused to its surface but not to its interior."

The Bruchiss plan calls for construction of factories and transportation facilities beneath existing natural resources.

For Plants Under Mountains.

"They would be built," he explained, "under mountains, for, no matter how destructive the atomic bomb, it would not tear away a mountainside."

He does not visualize the populace turning into human moles.

His program would put 25 to 30 per cent of our vital industries underground, under military control.

"A certain percentage of the people will work in these underground plants and become accustomed to underground living,"

he said, "so that if war comes, going underground will not be too much of a jolt."

The government, both federal and state, would bear the tremendous cost of building and maintaining the underground project.

Idea Called Aid to Jobs.

Mr. Bruchiss foresaw his plan as the answer to the expected unemployment problem.

"The project calls for earth removal on a tremendous scale," he said. "We already have the necessary equipment, the explosives and the trained manpower. The men and materials can be utilized immediately."

Living underground would be far from unpleasant, Mr. Bruchiss predicted, adding:

"We have perfected air conditioning and lighting, and have frozen and dehydrated packaged foods. People can stay underground indefinitely and suffer no ill effects."

A native of Chicago and a graduate of De Paul University and the Armour Institute, Mr. Bruchiss is a specialist on automatic engine controls for aircraft, similar to the automatic controls which motivate jet bombs and rocket projectiles. He is editor of the engines section of Aerosphere, international aviation authority.

Churchill Speech *By Eleanor Roosevelt*

SUNDAY.—I hope everyone in this country read with extreme care the full text of former Prime Minister Churchill's speech in Commons Aug. 16. He told us things we need to remember. He and President Truman learned of the success of the atomic bomb in Potsdam. They made the necessary military decisions and communicated to Premier Stalin the news that this new explosive could be used to bring about peace. Full knowledge remains with us in the United States alone, and, added Mr. Churchill in words I hope we will remember: "I rejoice that this is so. Let them (the United States) act up to the level of their power and responsibility, not for themselves but for all men in all lands, and then a brighter day may dawn in human history."



That is a pretty heavy burden, and one placed upon us not alone by the former Prime Minister. It was placed with us when the scientists working in our country, as well as the availability of our great resources, made my husband decide that we should carry on this research to its ultimate conclusion.

We must note and remember, also, Mr. Churchill's forthright statement that Premier Stalin had made it clear a long time ago that three months after the close of the war in Europe he would be able to throw the might of the Soviet Republics

into the war in the Pacific. Anyone knowing transportation conditions on the Trans-Siberian railroad knew without being told, that this three-month period would be a necessity. But the point is that Mr. Stalin gave his word and kept it. I have been told that it was given as far back as the conference in Tehran. That is a fact we must remember.

One cannot help but be glad that we will have the strong voice and courage of Mr. Churchill as leader of the opposition in Great Britain. It will be a loyal and straightforward opposition, and that is healthy and good for any country. This is especially so where one party is advocating new ideas and new methods, for clear-thinking opposition will force better thinking on the government in power. The situation in Great Britain is a very clear-cut situation, and many of us understand well why the British people—in spite of their undiminished devotion, affection and never-ending gratitude to former Prime Minister Churchill—still felt that the peacetime problems would be more effectively met by the Labor government.

We, here, have the same fundamental problems to meet, but our political situation is different. The forces in opposition to each other here are not as clearly visible to the average citizen. In the coming months we will have to devote more time to knowing our representatives as individuals, regardless of their party labels. We will have to make up our minds which are the men who are leading us in the way that we feel will be most effective for our peacetime life as the greatest and most powerful nation in the world.

THE NATION

Big Business Gets Inside Track on Atom Power

Liberal Forces, Peacetime Agencies Squeezed Out by Conservatives

By ALEXANDER H. UHL
Washington Bureau

WASHINGTON, Aug. 21.—A basic fight for the peacetime control and use of atomic energy—in which the American people have at least a \$2,000,000,000 stake—is steadily coming to a head in Washington. Thus far there is every indication that the recommendations to be made to Congress next month are shaping up strongly on the big business side.

Two things are clear:

¶ That the proposed legislation is being drawn by men who are extremely conservative and are far closer to the big corporation viewpoint than they are to the public.

¶ That the liberal forces in Washington—Wallace and Ickes, for example—are almost entirely on the outside looking in, without having any influence on what is to be proposed to Congress.

Truman's Plan

Yesterday Elbert Thomas (D., Utah), chairman of the Senate Military Affairs Committee, re-

vealed that he would introduce legislation now being prepared by the War Dept. which will cover both war and peacetime uses of atomic energy. The bill probably will be introduced after a special message

by President Truman proposing permanent Government control over all phases of atomic energy development.

To what extent that control will be exercised, whether atomic energy will be held under public ownership, whether small business as well as big business will be able to utilize it, are by no means clear.

Sen. Thomas said that the proposed legislation, whose details he would not discuss, would establish a National control body including representatives of State, War and Navy Depts., civilian scientists technical personnel and representatives of other civilian agencies.

Thomas Position

His own position he described as follows:

"Whatever course the law takes, you may be sure of one thing. The discovery of the secret releasing atomic energy was made with the money of the American people, it belongs to all the American people, and it must be used for the benefit of all the American people."

Which makes good sense. But a careful study of what has been happening would indicate that there is going to be a wide diversity in opinion as to how the American people should benefit by the discovery. And when it comes to that, it is very clear that liberal opinion has been pretty well squeezed out.

The report now being prepared for submission to President Truman—and it is understood that he is going to scrutinize it carefully—is being prepared in the War Dept. It is being prepared by an interim committee which is made up almost entirely of extremely able and fine,

but also extremely conservative, men.

It includes Secretaries Stimson and Byrnes, former Navy Under Secretary Ralph A. Bard, Dr. Vannever Bush of the Carnegie Institution of Washington, Dr. James B. Conant, president of Harvard; Dr. Karl T. Compton of Massachusetts Institute of Technology, and George L. Harrison, president of the New York Life Insurance Co.

Wallace Ignored

There are no signs that any of the normal peacetime official agencies have been given much chance to say what they think about the future of atomic energy.

There is the Interior Dept., now headed by Secretary Ickes, with its responsibility to conserve and develop our national resources—mines, petroleum, fuels, power. And there is Wallace's Dept. of Commerce, whose main job is to promote industry and whose agencies include the Patent Office and the Bureau of Standards.

It is known that Secretary Wallace is deeply interested in peacetime development of atomic energy but thus far hasn't had much chance to express his views on it.

What trend the proposed legislation will take is as yet unrevealed. The complexion of the interim committee gives some idea. The role played by Dr. Bush also must be considered. He is a powerful figure on the committee and his thinking was pretty well revealed in his recent report as director of the Office of Scientific Research and Development. His views on patent policy are revelant, for they reveal a bent against public ownership.

He has said:
"The success of the National Research Foundation . . . will depend to a very large degree upon the co-operation of organizations outside the Government. . . . The public interest will normally be adequately protected if the Government receives a royalty-free license for governmental purposes under any patents resulting from work financed by the foundation. There should . . . certainly not be any absolute requirement that all rights in such discoveries be assigned to the Government."

The original policy group appointed by President Roosevelt included Wallace, then Vice-President; Secretary Stimson, Gen. George C. Marshall, Dr. Conant and Dr. Bush. This group recommended a great expansion of the experimentation in progress in 1942 and a military policy committee was then appointed. Dr. Conant and Dr. Bush went to this committee, but Wallace disappears from view. Wallace won't talk, but the inescapable conclusion is that he was pretty thoroughly squeezed out.

The Gallup Poll:

Atomic Bomb Use Favored 85 Per Cent Approve It in War

By GEORGE GALLUP,

Director, American Institute of Public Opinion.

An odd twist in public thinking comes to light as a result of questioning people throughout the nation on the use of the atomic bomb against Japanese cities.

The public, which during the entire period of the war was found

unwilling to approve the use of poison gas against the Japanese, indorses overwhelmingly the use of the devastating atomic bomb.

The opinion is the same in every major part of the country, among both men and women, all age groups and all educational levels.

The question:

"Do you approve or disapprove of using the new atomic bomb on Japanese cities?"

Approve _____ 85%
Disapprove _____ 10
No opinion _____ 5

The question dealing with the use of poison gas was asked before the atomic bomb was used:

"Would you favor or oppose using poison gas against the Japanese if doing so would reduce the number of American soldiers who are killed and wounded?"

Favor using gas _____ 40%
Opposed _____ 49
No opinion _____ 11

The amazing unanimity of opinion on the question concerning use of the atomic bomb is shown in the following tables, giving the vote among the various major groups:

Ages	Approve Use Atomic Bomb	Disapp. Use Atomic Bomb	No Opin.
21-29	86%	10%	4%
30-49	85	10	5
50 and over	83	10	7
Sex			
Men	86%	9%	5%
Women	83	11	6
Education			
College	90%	7%	3%
High school	86	11	3
Elementary school or less	83	10	7

The reason given most commonly by people for opposing the use of poison gas was the fear of retaliations in kind.

Doom of Monetary Gold Seen in Atomic Advances

By The United Press.

SANTIAGO, Chile, Aug. 20—The end of gold as a monetary reserve was forecast today by British and American mining experts here as a result of the recent advances in atomic research that culminated in the atomic bomb.

"Gold can be made from mercury now, at a prohibitive price, but by splitting the atom the process becomes much easier and perhaps economic," Thomas C. Peddar, British mining engineer, said.

"It can also be made from lead by rearranging the electronic structure, now feasible by the new discovery," another mining man added. "Thus the ancient alchemists' dream comes true."

"Everything depends on control of the atomic energy used in the process. If the rate at which the energy is released is excessive, the gold product thus obtained would be destroyed either by heat or explosion," Paul Miller, veteran American nitrate expert, commented.

"Gold may become the cheapest thing in the world. It is the end of gold as a currency medium," a Chilean chemist said.



Sen. Thomas

OPINION

Power and Control in the Atomic Age: III

The Atomic Bomb and the Human Heart

This is the last of three articles on what the atomic bomb will mean for world politics and economics, what effects it may have on the theory and practice of power, and how its use can be controlled and kept from destroying the world.

I end with some notes on the atomic bomb and the human heart.

There are many who feel that the bomb is Satan's missile, should never have been invented; and, when invented, should never have been used; and, now used, should be erased forever from the human eye and mind. There is no question that it is a terrible thing to wipe out whole cities at a time. But war is a terrible thing in itself, and the expansion of its technology is limitless—as Gen. Arnold's most recent catalog of our war weapons reveals. Once you set your will on killing people, all the glories of science become the servants of the Devil.

Hating the Instrument

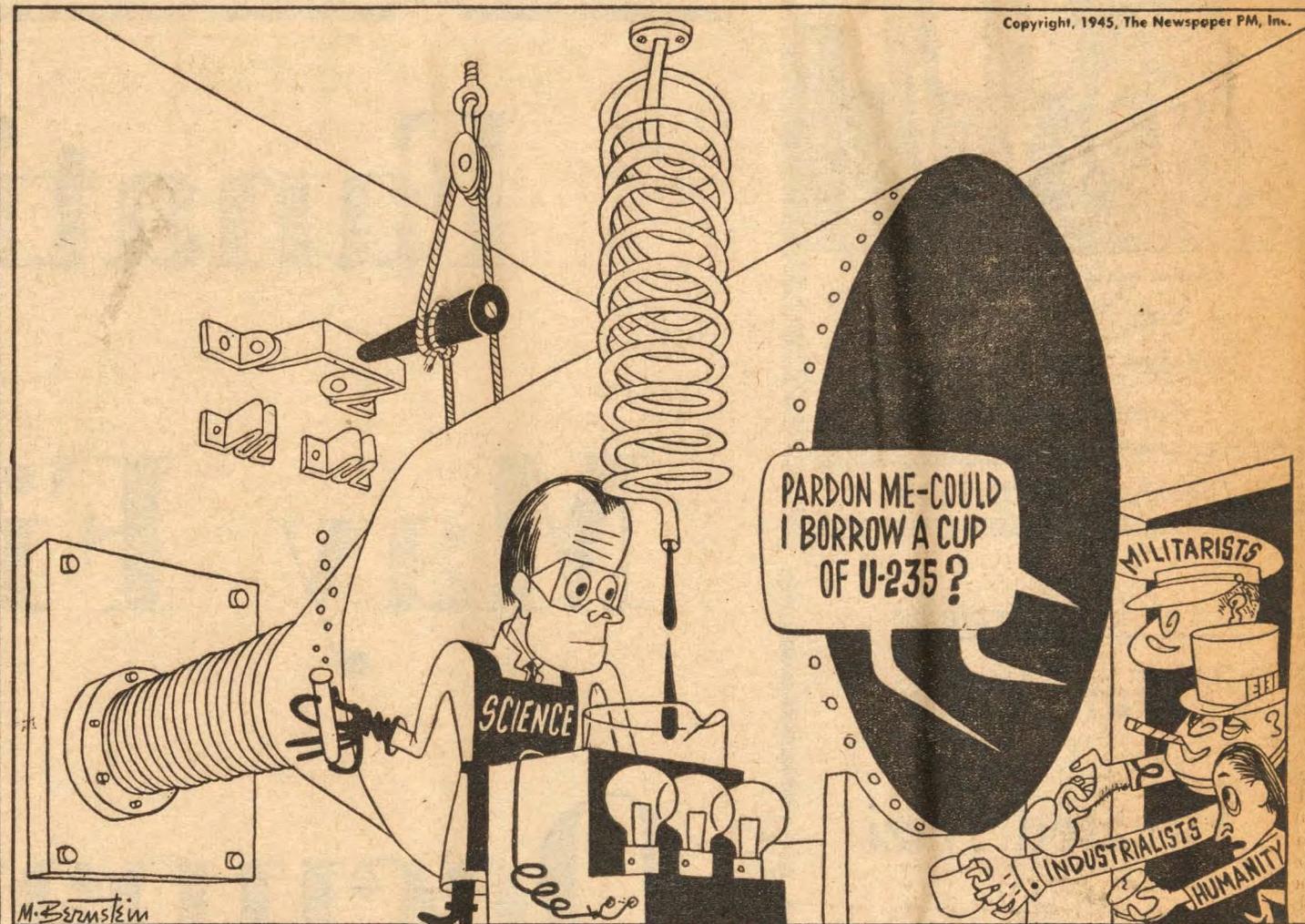
What differs then is not so much the mechanism as the spirit in which it is used. If it is used—as the Germans used the human furnace, or as some Americans wanted us to use poison gas—out of hatred and sadism, it brutalizes the user. If it be used, as I think we used the atom bomb, to end the war quickly, and with a loathing for its need, then the heart that uses it may be salvageable. The crucial difference is between the hatred for the civilians and the children you kill and the hatred for the instrument you use to kill them; between joy at their death and joy at the end of killing that follows upon the breaking of the enemy's will.

But even at best—and what a pitiable best it is—the whole business is messy. The ethics of the atomic bomb is like the ethics of all war. It is the ethics of mass killing. While mass killing is sometimes made necessary, nothing can ever make it civilized. But that is what happens when the logic of science is added to the logic of international anarchy. "A new anguish," says *Combat*, the best of the Paris newspapers, "has been added to the burdens of humanity."

The Evil in Man

It is an anguish not because atomic energy is in itself evil, but because man has evil in him. We learned in the case of the Germans (as I have written in these columns before) how far that evil can go in man, once it is unleashed in a society. Given that evil, every so-called advance in the science of war becomes a more repellent Gorgon-head to freeze us to stone as we contemplate its prospects. We must recognize that the potential evil is not absent from us, and that our society too can break down and the barriers be swept away that stand between us and the torrential stream of the inhuman. Given the atomic bomb, power can become more evil power than ever; evil can become more powerful evil than ever.

It would be foolish, however, to forget that there is a fascination for us in what the atomic bomb can do. In a world which seems to have lost the religion-creating faculty, science has become a new kind of religion for the millions. Men trust in it to lead them into new



pastures, to prepare their table, to make their cup of plenty run over. They look to it for miracles.

Henry Adams stood in a medieval cathedral in France and saw with a flash of insight that its modern American counterpart is the dynamo. But the age of electric energy is now being replaced by the age of atomic energy, the dynamo by the cyclotron. Science has become a trigger that sets off the limitless unraveling process of pent-up force. Mankind comes full-turn back to the sun again, the source of energy; and we become again, as savages were in humanity's dawn, worshippers of the sun's energy.

Miracles of Science

We talk of the miracles that atomic energy may perform in our economy: of what we have come to call, half in derision and half in awe, "that wonderful postwar world." Even the death and terror that are packed in the bomb do not destroy men's faith in science as a religion. For is it not proof of a God's power that He should be able to strike with thunder and fire and pestilence when His anger is aroused?

Here, then, is where we have come to. Man, who has boasted of his mastery over Nature, has now mastered it so completely that he can turn its complete violence against—himself. Nature has yielded up its inmost secret—the tension that lies within the structure of matter itself. Nor shall we begin to measure the full consequences of this fact for decades.

We cannot flinch from it. Atomic energy, like other aspects of our time, is the logical development of centuries of thought and effort, of our whole scien-

tific heritage. Now it is here, we can no more retreat from it as a fact of our technology than we can retreat from power and the state as facts of our political life. The only question about it, as about so many other facts of our time, is whether we shall be its victims or its masters.

We shall have to learn how to control the powerful evil—the evil power—that is in it.

The War Dept. talks now of setting up a new Control Board (see page 3). If it is anything like the present interim board, it will be made up of big soldiers, big scientists and big businessmen. None of these groups has the insight needed to control with any wisdom the terrible destructive force of the atomic

bomb. All of them have been trained in making or destroying things, or in making profit from production or destruction. None of them has been trained into turning power and potential evil into humanist channels.

Such a board will not be adequate unless its personnel is transformed. Even then it will not be adequate so long as it is only American, and not international. Atomic power cannot be nationalist and it cannot be capitalist. It must be a monopoly of the world which is otherwise its potential victim, and its controllers must be as broad as the humanity which alone can master it.

—MAX LERNER

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Texas Scientist Urges Wide Research

Dr. George W. Watt, associate professor of chemistry at the University of Texas, and one of the men on the Manhattan Project which helped develop the atomic bomb, has issued a statement with rather startling implications. Dr. Watt proposes:

¶ That scientists recognize their obligation to turn these spectacular discoveries on atomic power to constructive use.

¶ That scientists recognize a new degree of social responsibility for more active participation in governmental and public affairs.

¶ That scientists not retire to their laboratories and leave the future in the hands of politicians.

¶ That the public must insist that the government finance an adequate co-operative research organization to carry on atomic and all other kinds of scientific research.

¶ That this organization should have \$10,000,000 for atomic research alone in

the next 10 years.

Dr. Watt makes big claims for science, and backs them up with the proof of the atomic bomb.

"Five years ago, the utilization of atomic energy was deemed to be impossible or at least highly improbable," he said. "The co-operative efforts of physicists, chemists, engineers and other scientists in allied fields have demonstrated that under suitable conditions the 'impossible' of yesterday can become the accomplished fact of today.

"Just how rapidly the application of atomic energy to modern industry becomes a reality is largely for the public to decide.

"If a few atomic bombs can end a global war, humanity has fallen heir to the world's greatest bargain at the reported price of \$2,000,000,000. The important fact is that, when given adequate financial support and freedom from interference by selfish interests, modern science can do just about whatever needs to be done."

Nagasaki a Desert After Atomic Bomb

By the United Press.

SAN FRANCISCO, Aug. 21.—Tokyo radio said today that the second atomic bomb dropped on Japan turned Nagasaki into a desert of rubble and even crushed farmhouses 10 miles distant.

A photograph of the center of the city published in the Tokyo newspaper Mainichi shows nothing but rubble "as far as the eyes could see," the enemy broadcast said.

A second picture was said to reveal "the tragic scene 10 miles

away, where farmhouses are either crushed down or the roofs torn asunder."

The bomb was dropped on Nagasaki, arsenal and naval base city on western Kyushu, by a single superfortress Aug. 9, Tokyo time, three days after the first atomic bomb fell on Hiroshima.

Strategic air force headquarters in the Pacific said the bomb used against Nagasaki was of such improved design and power that it made the one dropped on Hiroshima obsolete.

Tokyo said a photographer who rushed to Nagasaki immediately after the raid found it a "dead city."

"All areas literally were razed to the ground," the photographer said. "Only a few buildings are left, standing conspicuously from the ashes. The steel framework of a factory was hurled down by the terrific blast of the bomb."

"The toll of the population was great, and even the few survivors have not escaped some kind of injury."

The enemy broadcast was reported by the FCC.

Another broadcast said the terrific white heat of the bomb blast burned many inhabitants of Nagasaki to death.

"The exposed portions of their bodies were burned pitch black," the broadcast said. "Even those who were far from the scene of the atomic bomb suffered scalds on exposed parts of the bodies."

"Many persons who saw the flash of the bomb explosion found themselves unable to see the next day because of injuries to their eyes."

Atom Casualties Total Half Million, Jap Says

By the United Press.

SAN FRANCISCO, Aug. 22.—The world's first atomic bomb exploded more than a quarter of a mile high over Hiroshima, releasing terrific whirlpools of energy whose immediate effects were felt for 10 minutes, a Jap technician said today.

Jap broadcasts later said atom bomb raids on Hiroshima and Nagasaki had cost nearly a half million "casualties and sufferers" and leveled buildings within a radius of 10 miles.

No Shelter Possible.

Sutezo Torii, technician for Jap Imperial Defense General Headquarters, in a survey of the results of the Hiroshima bomb broadcast over Tokyo radio and recorded here by the United Press, described the bomb's explosion as a "monstrous spectacle." He said the bomb was dropped by parachutes.

Torii said it was impossible to obtain shelter behind solid buildings within the bomb's effective range.

Torii returned to Tokyo yesterday, the broadcast said, with "numerous data."

A Superfort, he said, on Aug. 6 over Hiroshima, dropped a bomb from an altitude of 25,000 feet and turned west. By the time the bomb exploded the plane was about eight miles from the point it released the missile.

"Three apparatuses attached to the parachute after the bomb exploded fell on the ground north of the target area," the account said.

"There were approximately 100 seconds between the time the atomic bomb dropped and the time it exploded. After the parachute opened it is estimated there were approximately 60 seconds before the bomb exploded."

Circular Heat Waves.

"When the atomic bomb exploded there was seen a flash and white smoke, which gradually formed into a cumulus."

"Persons on the ground, who witnessed this monstrous spectacle said when the atomic bomb exploded they saw ripples of circular heat rays. The waves are believed to have continued for approximately two seconds."

"Explosive pressure after the blast," Torii declared, was "felt for a considerable length of time."

Without elaborating, he added that "there are about 10 minutes between the time houses are destroyed and the time they first catch fire."

The second atomic bomb dropped Aug. 8 on Nagasaki took a toll of "more than 10,000 persons killed, more than 20,000 wounded and more than 90,000 rendered homeless in the city," Tokyo said.

"Furthermore, many persons are dying daily from burns sustained during the course of the raids."

More than 60,000 were killed in Hiroshima Aug. 6, Tokyo said, and "the number of dead are mounting as many of those who received burns cannot survive their wounds because of the effects the atomic bomb produce on the human body."

"Even those who received minor burns," one broadcast asserted, "looked quite healthy at first, only to weaken after a few days for some unknown reason and frequently died."

Delayed A-Bomb Deaths Of Japs Explained

By HOWARD W. BLAKESLEE, Associated Press Science Editor.

The Japs who were reported today by Tokyo radio to have died

mysteriously a few days after the atomic bomb blasts probably were victims of a phenomenon which is well known in radiation laboratories.

They died from the after-effects of rays created by the explosion.

Two kinds of burns were made by these rays. One is the gamma ray, or X-ray, familiar to physicians.

More likely as the cause of the delayed Jap deaths are the effects of a different kind of rays, those which are made by a stream of concentrated neutrons.

This sort of ray has been produced by a cyclotron. It is visible. It is about five feet long, a few inches in diameter, its color a pale, electric blue. This ray is considered probably almost instantly lethal.

Animals were exposed to neutron rays, much less concentrated than this picturesque laboratory exhibit. The concentration of neutrons given the animals was like the concentrations that might appear momentarily in the explosion of the atomic bombs.

The animals died in a few days. They were not apparently much harmed at first. They died because the neutron rays had destroyed a lot of their white blood corpuscles.

WT 8/24

30,000 Died After Hiroshima Atomic Blast, Japs Say

Death Toll Doubled During 14 Days Following Attack

By the Associated Press.

The Tokyo radio said today that radioactivity in Hiroshima, blasted by an atomic bomb, was taking a mounting death toll weeks after the attack, and that in the 14 days following the raid the death toll mounted from 30,000 to 60,000.

[The bomb "instantly crushed 90 per cent of the houses in the city, according to Jap broadcasts heard by the United Press.]

The broadcast, recorded by the Associated Press, said Jap soldiers working in the area on reconstruction a week after the attack were found to have severely diminished quantities of red and white corpuscles.

Investigations in the city showed "radioactivity caused by the fission of uranium used in the atomic bombs is taking a toll of mounting deaths, and moreover is causing persons engaged in reconstruction work in Hiroshima to suffer from various sicknesses and ill health."

Bid for Sympathy.

Tokyo broadcasts have been referring repeatedly to the atomic bomb raids on Hiroshima and Nagasaki, possibly in a bid for world sympathy.

The broadcast said:

"Although the war has ended, the spectre of death hangs over the remaining citizens of Hiroshima. In an investigation made three days after the atomic bomb hit Hiroshima, it was reported there were 30,000 dead and 160,000 injured out of a total population of 250,000. Two weeks afterward the death toll had mounted to 60,000 and it is continuing to rise."

"The majority of the injured persons received burns from powerful ultra-violet rays from the atomic bombs, and those within a two-kilometer (1 1/4-mile) radius from the center of the bomb explosion received burns two or three times."

Burned Without Heat.

"Those within three to four kilometers (about two miles) radius of the bomb received burns to the extent that their skin turned bright red, but as these burns were caused by ultra-violet rays they hardly felt the heat at that time. Two hours later, however, blisters formed, resulting in dropsy."

"Although abundant medical supplies were rushed to the scene of the disaster and treatment was unsparingly given the victims, the death list continued to grow daily. It is recalled that following the atomic bomb raid on Hiroshima an American radio broadcast said Hiroshima had been turned into a place where living creatures cannot exist for 75 years. It added that to send scientists to investigate the damage caused by the atomic bomb would be suicidal."

U. S., SOVIET SEEN LEADING IN SCIENCE

Dr. Langmuir Predicts Full Cooperation in Showing Program to World

NYT 8/22

Predicting that Russia and the United States would jointly lead the world in the development of science, Dr. Irving Langmuir of the General Electric Company said last night that his recent visit to the scientific congress in Moscow had convinced him that cooperation with the Russian people would be easy.

Three hundred scientists attended a reception last night in the Men's Faculty Club of Columbia University, under the auspices of the American-Soviet Science Society, honoring Dr. Langmuir and five other members of the American delegation of sixteen that attended the congress. All six praised the hospitality they had received and urged fuller exchange of information between the two countries.

Dr. Langmuir said that the thing that interested him most in Russia was the amount of work that was being done in pure science, without regard to its practical application. He said that he hoped Russian scientists would visit this country and that he was certain that they would not make any effort to "go prying around for information they are not entitled to."

Prof. Harlow Shapley, Harvard astronomer, revealed that while in Moscow he and two other members of the American delegation had attended one session of the trial of the sixteen Polish officers. He said that it was "the most interesting, fair and open court proceeding I have ever seen, and I have seen many of them." He scoffed at the possibility that the confessions made in open court could have been extorted.

Dr. Shapley said that the Russians were building the future of their country on a scientific basis, while he contended that in this country science occupied merely a "peripheral" place in the national life. He said that in a competitive world the United States must recognize the need for Government support of scientific research.

Dr. Detlev W. Bronk of the University of Pennsylvania said that the competition of Russian science should prove a stimulus to American scientific progress. He called for acceptance of mutual honest criticism by the two countries. He said he was convinced there was a basis for real and lasting friendship between the two nations "if only we can be courageous enough not to deceive ourselves."

Dr. Jacob Heiman, cancer research specialist; Dr. Arthur Upham Pope of the Iranian Institute, and Dr. Arpad L. Nadai of the Westinghouse Laboratory also spoke. Dr. Leslie C. Dunn of Columbia University, chairman of the American-Soviet Science Society, presided.

They Can't Believe It

The thirty-four estimable pastors and educators who signed the message to President Truman protesting the use of the atomic bomb were giving a tragically perfect demonstration of one of the most alarming of the bomb's implications. The atomic bomb is a terrible triumph of the physical sciences which presents an immediate and overwhelming challenge to all our resources of politics and morals. And what do our best resources of politics and morals have to offer? Among other things, this foolishly sentimental outburst—an eloquent expression of fear, horror, surprise, revulsion and similar violent emotions, but virtually meaningless as a statement of the facts and worse than useless as a guide to the action demanded of us.

To cite examples: The message begs the President to press for international commitments "outlawing the atomic bomb and also war." If the signers had reversed the phrase and demanded the "outlawry of war and also the atomic bomb" one could have respected their intellectual clarity. As it is, one is left to assume that if the bomb is "outlawed"—whatever good that would do in practice—they are willing to track along with all the illimitable horror and suffering of war itself. Only get rid of the new and dramatic and upsetting manifestation of the disease, and they will accept the routine agonies of the disease as the world has known it.

The message also announces that "we cannot believe [the atomic bomb] was even essential to the defeat of Japan. Its reckless and irresponsible employment against an already beaten foe will have to receive judgment before God." How do they know the foe was already beaten? Only because they "cannot believe" otherwise. Because they "cannot believe" the contrary, it must be so. Human history is littered with the disastrous wrecks of such convictions. The Japanese followed their god-emperor to world conquest because they were simply incapable of believing that Hirohito was not the direct descendant of the Sun Goddess. Unfortunately for the Japanese and for the world, however, that incapacity did not establish the fact.

For the men who developed this bomb it was not enough simply to refuse to believe that the effect would be terrible, or to refuse to believe that the radioactive energies developed in manufacture would be dangerous, or to refuse to believe in the possibility of exploding the earth by an uncontrolled reaction. They may not have liked to believe any of these things—some, indeed, are reported to have hoped that their experiments would fail—but they had to believe the facts and to take the necessary precautions against them. Perhaps they "could not believe" that workers would be injured by the radiation, but all the same they had to calculate the likelihood to the last decimal and build the defenses of lead and concrete and what-not to the calculated strength beforehand. That is the method of science. One can only contrast it with the method of these churchmen and educators.

The lesson seems very plain; and it seems to be that the churchmen and educators—not to mention the politicians and international lawyers and editorial writers and soldiers and many others—will have to do a great deal better than they have done in the past if they are to meet the challenge which science has starkly presented to them.

1945

M. P.'S RAISE ISSUE ON ATOMIC BOMB

British Laborites Ask World Control, Challenging Attlee and Churchill on Plans

By SYDNEY GRUSON

By Wireless to THE NEW YORK TIMES.

LONDON, Aug. 21—A group of Labor members in the House of Commons challenged the British Government tonight over its policy on the atomic bomb by filing a motion calling for an international organization to control the new weapon, after Prime Minister Clement R. Attlee had announced that an advisory committee under Sir John Anderson would aid the Government in dealing with questions raised by American-British possession of the secret of atomic fission.

The motion brought to the fore a sharp division of opinion in Britain over the issue of locking up the atomic bomb secrets with the United States Government as suggested by Former Prime Minister Winston Churchill, or sharing them with other United Nations.

The motion, drawn up by Capt. Raymond Blackburn, will be offered as an amendment to another motion by Foreign Secretary Ernest Bevin asking the House of Commons tomorrow to approve ratification of the United Nations Charter.

Terms of Blackburn Proposal

The Blackburn amendment, signed by eight other Labor members and an Independent, would add the following to Mr. Bevin's motion:

And further expresses the opinion that the security proposals contained therein have been rendered inadequate by the atomic bomb and that the Government should take steps to represent to the United Nations that:

(A) An international center for research and production in relation to atomic power should be created at international expense and staffed by international scientists and experts;

(B) A system of international inspection of national laboratories and production plants should be instituted for the purpose of insuring that no development of atomic power for purely national purposes takes place.

Prime Minister Attlee said the committee of which Sir John will be chairman would advise the Government "to assist them in dealing with the many far-reaching questions raised by this new discovery, both as regards its international treatment and its further development in this country, whether for industrial or military purposes."

Sir John Anderson, former Chancellor of the Exchequer, headed the British committee under the Churchill Government that worked with Allied scientists on the development of the atomic bomb in the United States.

"Policy" Rests With Government

After Mr. Attlee's statement Mr. Churchill asked him to make it "quite clear" that the new Anderson committee would deal with technical aspect of the study of atomic energy and would not be concerned with the main policy to be adopted by this or other countries.

"Policy, of course, has to be decided by the Government," Mr. Attlee replied.

Calling attention to Mr. Churchill's proposal that the United States retain exclusive possession of the secrets in the atomic bomb's manufacture, S. S. Silverman, Labor, said that "exclusive knowledge and exclusive use in the sole discretion of one Power of an overwhelmingly destructive force of this kind would make nonsense of the whole conception of collective security."

Besides Sir John, the members of the new committee announced by Mr. Attlee are Sir Alexander Cadogan, Permanent Under-Secretary of the Foreign Office; Field Marshal Sir Alan Brooke, Chief of the Imperial General Staff; Sir Alan Barlow, Second Secretary to

Army's Atom Splitters Get Own Shoulder Patch

Special to THE NEW YORK TIMES.

WASHINGTON, Aug. 21—The Army's atom-splitters, who worked so long in anonymity, have received a special shoulder patch in recognition of their historic accomplishment, it was learned today.

Maj. Gen. Leslie R. Groves, who directed the secret project, was displaying at his headquarters today the first of the distinctive patches seen in Washington. The device principally is the star of the Army Services Forces, encircled by a large question mark.

The dot under the question mark represents a globular object in the process of splitting. It is supposed to represent the atom being split, but authorities gave solemn assurances that the symbol betrayed no "military secrets."

The patch was authorized by the Secretary of War and may be worn by everyone attached to the once secret Manhattan Engineering District, which takes in installations in Tennessee, New Mexico and the State of Washington, and headquarters in this city.

the Treasury; Sir Edward Appleton, director of the Department of Scientific and Industrial Research; Sir Henry Dale, president of the Royal Society; Prof. P. M. S. Blackett, Sir James Chadwick and Sir George Thompson.

NAGASAKI REPORTED IN RUINS

Tokyo Says Atomic Bomb Tore Buildings 10 Miles From City

The Tokyo radio said yesterday that a photograph of Nagasaki, second Japanese city to be struck with an atomic bomb, showed that "the center of the once thriving city has been turned into a vast devastation with nothing left except rubble as far as the eyes could see."

The English-language broadcast, directed to North America and recorded by the Federal Communications Commission, said that photographs of bomb damage appeared on the front page of the newspaper Mainichi.

One of the pictures revealed a "tragic scene ten miles away from the center of the atomic air attack, where farm houses are either crushed down or the roofs torn asunder," reported the enemy broadcast.

The broadcast quoted a photographer of the Yahama Photographic Institute who had "rushed to the city immediately after the atomic bomb hit" as having said: "Nagasaki is now a dead city, all areas being literally razed to the ground. Only a few buildings are left, standing conspicuously from the ashes."

The photographer said that "the toll of the population was great, and even the few survivors have not escaped some kind of injury."

Fears Scientists As Atom Tyrants

Reinhold Schairer, executive director of the World Education Service Council and visiting professor at New York University, urged today that the secret of the atomic bomb be handled in the same manner the medical profession handles its scientific knowledge.

"The medical profession," he told the Men's Faculty Club at Columbia University in its annual conference on science, philosophy and religion, "has in every modern town poison and bacterias that would suffice to kill whole towns if used for this purpose. Yet these media are used for the benefit of man, not for aggression and destruction."

William Siefritz, professor of botany at the University of Pennsylvania, warned against permitting scientists to become the tyrants of the atomic area.

Describing the modern scientist as "a high pressure research man," he warned that "academic imperialism is evident on all sides. The monarchical policies long evident in the medical association now reveal themselves in such other organizations as that of the chemists . . . where the tremendous successes of chemical research in warfare have given this group unheard-of prestige in the scientific world."

"Such a power in science can become as dangerous as the influence of a political or social group."

Atom Bomb's Job Is Done—For This War

Manila, Aug. 21 (AP)—There is no reason for further use of the atomic bomb, reliable authorities said today on the basis of any foreseeable development in concluding peace with Japan.

The world's deadliest weapon will be sheathed for Gen. MacArthur's occupation. If trouble comes it undoubtedly will come only from small bands of hot-headed fanatics, and the atomic bomb is not practical against small groups.

Americans who want a stable peace obviously would not use a weapon which would wipe out thousands of innocent civilians and probably rekindle a full-scale war.

Secured in 8-21-45

Didn't Split Atom for a Bomb —Dr. Meitner Tells Own Story

(News of the atomic bomb reached Dr. Lise Meitner, whose research made it possible, as the vivacious 67-year-old Viennese scientist was resting at a summer hotel in Idalarne Province, central Sweden. Not relishing the sudden limelight into which the news plunged her, Dr. Meitner left for Goeteborg. There, at the request of the Overseas News Agency, she wrote the following modest description of the role she played in laying the groundwork for the greatest scientific achievement in centuries. Dr. Meitner will shortly return to Stockholm, where she has been experimenting with uranium fission at Dr. Siegbahn's Institute. She has been associated with the Nobel Institute in Stockholm since 1938. Politically, Dr. Meitner has been active in the Democratic Austrian Society, which fought the Axis throughout the war.)

By LISE MEITNER

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Stockholm, (ONA—By Wireless)—When the first atom bomb was dropped on Hiroshima on Aug. 5, it suddenly directed the public's attention toward a field of research which, at least up to 1939, had developed quietly in scientific laboratories and the technical applications of which on a larger scale had not come into question.

I am speaking of the field of atomic physics and particularly of that phase of the work concerned with artificial transmutation of

the elements. It is in this connection that my name has come into the limelight.

The road leading from a purely

scientific research to its application to technical problems is normally a lengthy one, and even after the possibility of such an application has been realized in principle its development into industrial production often meets with great difficulties.

In general, the scientists who have contributed to the solution of a scientific problem do not participate in the final technical utilization of their results. So it has been, at least as far as I am concerned, in the case of the development of the atom bomb.

At the beginning of 1939, Dr. Otto Hahn and Dr. E. Strassman (German physicists) in connection with earlier work done in collaboration with me, discovered the fission of uranium into lighter elements. Dr. Otto R. Frisch (Danish physicist) and I then gave the explanation of the phenomenon on the basis of Dr. Niels Bohr's model of the atomic nucleus, and we were able to show that this process (uranium fission) involves an enormous liberation of energy. (Dr. Bohr is the Danish physicist and Nobel Prize winner who was first to tell the Allies of Dr. Meitner's findings.)

At that time nothing was further from our minds than the utilization of this energy for the manufacture of atom bombs. And when the theoretical possibility of such utilization had been discovered I, like any other responsible person, hoped that its practical realization would not be possible.

Urgent Job for Physicists

Later on, as it became clear that the Germans might succeed in the construction of atom bombs during the war just ended, the forestalling of this became, of course, a most urgent problem for the physicists of the Allied side. This hope was not only based on the fear of the consequences to mankind of such utilization. The scientist is ever awestruck at the discovery of the laws of nature, and to use these

laws for the construction of weapons which might lead to the annihilation of mankind must seem blasphemy to him.

My interest in atomic physics goes back to my first year's study in my home city of Vienna. I recall vividly how fascinated I was when, still busy with my baccalaureate studies, I read in the newspapers about the discovery of radium by Pierre and Marie Curie.

And when, in 1908, I went to

Berlin to continue my scientific education and, in addition to my theoretical studies with Max Planck (German physicist who originated the quantum theory and 1918 Nobel Prize winner) I had the chance to begin some experimental work with Dr. Hahn, I was happy in this way to be able to penetrate more deeply into the field of radioactive atomic research.

After three years as assistant to Dr. Planck at the University

of Berlin, during which time I had been continually experimenting with Dr. Hahn, I was entrusted in 1917 with the task of organizing a department of physical radioactivity at the Kaiser Wilhelm Institute of Chemistry in Berlin-Dahlem. This gave me the opportunity to investigate on a broad basis, with a staff of assistants and students, the problems of natural and, later, artificial transmutation of the elements from their physical side.

My life in Berlin also made it possible for me to follow closely the explosive development of atomic physics in some of its branches. Thus, when in 1912 Max von Laue (German physicist and 1914 Nobel Prize winner) made his great discovery of the interference of x-rays (in crystals) we were shown the very first Laue diagrams.

While peaceful scientific activity had been interrupted by the first World War, the advent of the Hitler regime meant a much deeper change. Even the most intense concentration on work could not make one forget the many people who were being robbed of their most elementary human rights.

After the occupation of Austria in 1938, my personal situation became more difficult. (Dr. Meitner is Jewish.) When I heard that Himmler had ordered that university teachers no longer be allowed to leave Germany, I decided to go away secretly.

Since my Austrian passport was not valid in any country, Dutch colleagues of mine obtained the permission of their government to let me enter Holland without a visa. Thus, I came first to Holland and thence, by way of Copenhagen, to Sweden.

The first two atom bombs have been dropped in recent days. May they also be the last ones. The energy liberated by the uranium

fission will, it is to be hoped, in the years to come find application in power plants, thus raising the prosperity of all nations through collaboration and thereby also stimulating progress in the higher sense of the word.

Atomic Age Defenses

A Nonpartisan Civilian Board Held Vital To Meet Broad New Planning Concepts

By HANSON W. BALDWIN

Special to THE NEW YORK TIMES.

WASHINGTON, Aug. 23—The appointment of a civilian non-partisan commission, patterned after but broader in scope than the old Baker and Morrow boards, is being urged by many high Government officials here.

The innumerable problems of evolving an adequate post-war defense system, modernized to accord with the lessons of the technological revolution in war and to fit the commitments of our post-war foreign policy, are so important and so many that no comprehensive non-partisan study is probable unless such a commission is appointed.

It requires only a few hours in Washington to convince any impartial observer of the need for such a study, and many of the trends and unsettled questions now arising are sufficient evidence of its urgency. The truth is that the pattern of our post-war defense probably will be shaped—unless such a comprehensive study is made—in the next six months, and it may well be a distorted and uncoordinated pattern.

Not Attuned to New Age

For today, there is no over-all defense planning, and there certainly is too little judicious atomic age thinking.

One example will suffice:

A House Naval Affairs subcommittee headed by Representative Ed V. Izac, Democrat, of California, urged last week after a 21,000-mile trip through the Pacific that the United States take "full title" to numerous bases in the Pacific, many of them owned or at least theoretically controlled by other Allied powers. The report, well meant though it undoubtedly was, demonstrated more than the re-emergence of imperialistic thinking. Its magnificent scope embarrassed the Navy; for once a Congressional subcommittee has recommended far more than the Navy wants or believes it needs. Its blunt tones will alarm some of our Allies, already worried by the possibilities of American economic imperialism.

But, perhaps more important, none of the thinking and planning done by this committee—or, for that matter, by the Navy—in relation to our post-war need for bases has been attuned to the new world in which we have lived since Aug. 6, when the first atomic bomb was dropped on Hiroshima. The atomic bomb, plus the rocket and radar and all the other marvels of this age of aerodynamics, electronics and atomics, has wrought a revolution in warfare so profound that the strategical conceptions against which our need for bases was measured in the past no longer have the same validity today.

Implications to Develop

The full implications of this technological revolution will not, of course, be realized immediately; it may be two to five years or more before the secret of the atomic bomb becomes known to other nations and they are able to manufacture it, and much longer before transoceanic missiles are commonplace. For the immediate post-war period we shall depend therefore, and rightly, upon the well-tried and well-tested instruments of warfare of the age now ending—the aircraft carrier, the long-range piloted bomber, amphibious forces—and these all require advanced bases.

But in the years to come the transoceanic rocket and other guided, target-seeking, pilotless missiles

with atomic warheads will span the broad seas and roar through the stratosphere from continent to continent. Advanced bases will be by-passed; may, indeed, become too difficult to defend. The utility of small island bases such as Johnston, for instance, will at least be open to serious question in the age of guided missiles; one or two missiles dropping from the skies on a tiny flat island could wipe out all its installation. Only large island masses with rugged or mountainous terrain, which readily lend themselves to dispersion and to the construction of underground shelters, will be well suited to development as advanced bases.

But the inevitable strategical trend in the age of rocket power and atomic bombs will be the enhancement of the importance of the continental position, as opposed to the insular position. Dispersion and underground defenses, as well as great industries, are essential to this dawning Buck Rogers era, and only continents—not islands—can provide these in profusion.

Broad Planning Essential

This does not mean that the United States will not need some advanced bases. We shall, particularly in the interim period immediately ahead, but we shall be making a mistake if we emphasize them too greatly in our long-term planning, or spend too much money on them at the expense of more important elements of a well-rounded defense.

This one example demonstrates graphically the need for the new thinking and broad new planning that now are demanded. This war has shown in one sense the indivisibility of military force, and yet that lesson is not fully appreciated. A prominent young Air Forces general the other night told one of our leaders that the Air Forces ought to be entrusted with the development of the atomic bomb, for they must use it.

Yet the other services can make similar claims. The Navy wants to see what atomic energy, in the form of a depth charge, can do to ships; the ground forces doubtless have ideas of their own.

A Big Job for Big Minds

And are transoceanic pilotless rockets, the guided missiles of tomorrow, "air power" or are they "long-range artillery"? If they are the former, one might as well call arrows and rifle bullets "air power;" on the other hand, if they are the latter, one might as well call airplanes "shells." They are neither the one nor the other; they are both, and they are more.

Yet the danger is that this will not be recognized and that military science, as now organized in its disparate branches, will commence to indulge in semantics. Uncoordinated planning of the Army and Navy, planning that has not yet been geared to the age of atomic power, and service rivalries can cost us dearly in money, and above all in military efficiency, unless we think broad new thoughts, and unless some unified control and direction of plans now aborning is provided.

It is a big job for big minds, beyond the capacity of any one man or group of men who are doing other jobs. Military planning for tomorrow is today at sixes and sevens. A civilian commission of some of the leading men of the nation to give undivided time and attention, and nonpartisan judicial thought, to our post-war military requirements is one of the great needs of today.

Atomic War Viewed As No More Deadly

By Cable to THE NEW YORK TIMES.

LONDON, Aug. 23—Amid all the dire prophecies about atomic energy and the next war, one scientist here predicted today that future wars would be no worse than past ones.

Sir George Paget Thomson, chairman of the committee of scientists appointed in 1940 to study the wartime development of atomic power, said: "The weapons of the war which ended three months ago were more formidable than those used in 1914-18, yet our losses in men were only one-third and Germany's losses in either war were fewer than in the Thirty Years' War, when gunpowder was in its infancy.

"If there is another war and atomic bombs are used, I don't believe the number of people killed will be greater than in this war and might well be less, since it is easier to protect people than machinery from very violent explosions because it is easier to disperse them. The objectives will be factories, not armies. Towns will be evacuated when relations between countries become strained, and atomic bombs are too valuable to be wasted on the countryside."

Japan Says Bombs Destroyed 44 Cities, Killed 260,000, Left 9,200,000 Homeless

NYT 8/24

SAN FRANCISCO, Aug. 23 (U.P.)—The Tokyo radio said today that forty-four Japanese cities were almost completely wiped out and nearly 10,000,000 people killed, injured or rendered homeless by Allied air assaults on Japan throughout the war.

The first cumulative figures of air attack casualties and damages issued by Tokyo said one-fifth of Japan's 206 cities were almost totally destroyed with a death toll of 260,000. In addition, thirty-seven other cities, including Tokyo, lost more than 30 per cent of their built-up areas under the high explosive and fire bombs of United States aircraft, the broadcast said.

The Japanese air defense general headquarters gave the following totals, "which are still incomplete and are likely to mount as further investigations are made":

Killed: 260,000, of whom 90,000 died from the atomic bomb blows on Hiroshima and Nagasaki.

Injured: 412,000, including 180,000 atomic bomb victims.

Homeless: 9,200,000.

Houses wrecked: 2,210,000 completely demolished or burned down and 90,000 partially damaged.

Most of Mainland Hit

"Almost the entire Japanese mainland received heavy damage as a result of the enemy air attacks," said the broadcast, recorded here by The United Press. Damage was comparatively small, however, in Akita, Yamagata, Shi-

kawa, Nagano, Shiga, Kyoto, Nara, Shimane and Tottori prefectures, all on Honshu, the broadcast said.

Three of those cities only slightly damaged were "death list" cities warned in advance by the United States Twentieth Air Force.

Japan's airplane production reached a peak of 3,000 a month in June, 1944, but was reduced to 1,000 a month by last July as the result of American bombing, Lieut. Gen. Saburo Endo of the Munitions Ministry, said. He declared that at the start of the war Japanese production was only 500 planes a month.

Hardest Hit Cities Named

The Tokyo broadcast, as recorded by the Federal Communications Commission, said the following forty-four cities suffered over 50 per cent loss of buildings by fire: Aomori, Mito, Hitachi, Utsunomiya, Maeda, Tokyo, Hachioji, Yokohama, Kawasaki, Hirazuka, Nagasaki, Toyama, Fukui, Tsuruga, Kozu, Shizuoka, Hamamatsu, Numazu, Shimizu, Nagoya, Toyohashi, Okazaki, Tsu, Yokkaichi, Ujiyama, Tsuyama, Osaka, Kobe, Himeji, Amagasaki, Akashi, Nishinomiya, Wakayama, Okayama, Hiroshima, Tsuyama, Tokushima, Kochi, Takamatsu, Matsuyama, Nagasaki, Kumamoto and Kagoshima.

Prefectures receiving the most casualties were: Tokyo, Hyogo, Okayama, Kagoshima, Kumamoto, Tokushima, Kochi, Kagawa, Oita, Aomori, Hiroshima and Nagasaki.

10-Mi. Radar Gun Seen Answer to Atom Bomb

WT 8/24

By the United Press.

WASHINGTON, Aug. 24.—The Navy thinks it may have found the answer to the atomic bomb—a radar-controlled gun capable of bringing down any hostile plane approaching within 50,000 feet of a battleship.

So confident are Navy officials of the gun's efficiency that Secretary James V. Forrestal has told members of Congress that he hopes it will protect the fleet from any possibility of atomic bomb attacks, should America ever again become embroiled in war.

On the other hand, still more potent kinds of atom bombs are expected to be developed. No one knows yet just what would hap-

pen if one should be set off in the water even 10 miles from a ship. Tests may be made to find out.

The Navy's new gun is understood to be entirely automatic in operation, its firing action synchronized with radar. As soon as a plane appears on the radar screen, it will be subjected immediately to a hail of shells.

In view of the development of the new gun, it is understood, Navy officials believe that a major two-ocean fleet will still be feasible and necessary despite the devastating power of atomic weapons.

By Albert Deutsch

Atomic Bomb Has Stirred Up Too Much Hysterical Talk

There's been a lot of loose and dangerous talk about the atomic bomb lately. Some of our journalistic jingoes are saying:

"We've got the world in the palm of our hands right now. Let's grab everything in sight while the grabbing's good."

Then there are the reactionary Russophobes who cry:

"Now's the time for a showdown with those Russians. All we have to do is to shake an atomic bomb in their faces and they'll knuckle under and do as they're told. And if they really try one atomic bomb over Leningrad and another over Moscow we'd have been hollering 'Uncle.'"

Since the epochal explosions at Hiroshima and Nagasaki, there's been too much hysterical talk and too little sound sense in the public discussions of the atomic bomb and its meaning for the future, in a military and civilian sense. It's high time for some sober stock-taking, and possibly for some healthy deflation of the atomic bomb.

We might start with a few down-to-earth facts like these:

The atomic bomb is the mightiest military weapon yet devised, but it isn't God. It can wreak fearful destruction and death in dense centers of population. It can kill and maim hundreds of thousands of civilians in a single raid. Its further development may increase its killing power. It has yet to be shown that it can or will be a decisive factor in the next war, if civilized nations are crazy enough to plunge into another bloodbath.

What effect would the atomic bomb have in destroying the decentralized industrial power of a modern nation? We are told that the German industrial plant stood up surprisingly well in spite of the

long, continual and merciless poundings by swarms of heavy bombers the cumulative impact of which were comparable at least to that of a few atomic bombs. Another unanswered question is: what destructive effect would atomic bombs have on armies and scattered military installations?

We were the first to perfect and use the atomic bomb, but the secret may not be ours alone. The releasing of atomic energy is not the only source of mass destruction. We can be sure that the Soviet scientists haven't been sleeping all these years. The invention of frightful weapons is well-nigh limitless in the atomic and in other fields. If atomic energy can be loosed on civilian masses for the dubious purposes of cracking "national morale," so can poison gases and other destructive weapons.

The USSR, the war-drum beaters should be reminded, sprawls over one-sixth the earth's land surface. It comprises more than Leningrad and Moscow. The Russians, back in the 1941 blitz, were prepared to discount the loss of both cities and still were confident of ultimate victory.

What I'm trying to say is that the fools and criminals who are already whipping up a new, needless war before the last guns of this one have yet to be fired are calling for a mess that would take a toll of millions of lives on our side as well as the others.

As for civilian uses of atomic energy, there are also many questions yet unanswered. How much needed material is available? What would be its cost? How could it be harnessed to civilian pursuits?

We have entered the Atomic Age, to be sure, but the future of that age is still a great question mark.

PM 8/23

THE ATOMIC INSIGNIA



The shoulder patch which the Army will issue to approximately 3,500 officers and enlisted men assigned to work on the bomb. The Army interpretation of the patch says the blue field represents the universe, the small army service star signifies the command, a question mark indicates secrecy cloaking the project and the tail of the question mark becomes a lightning stroke splitting an atom.

11/11/45 8-25 Associated Press Wirephoto

Gun to Plow

8/24 By Eleanor Roosevelt

How very appropriate is the change made by President Truman from the model gun on his desk to the model plow! Many newspapers have commented editorially upon this change, pointing out that a plow may mean not just an agricultural implement for farm use, but also be the symbol of a new type of work undertaken which eventually should lead to a harvest.



Nowhere have I seen mentioned the fact that many years ago, at the time of the last war, Secretary of State William Jennings Bryan beat some swords into plowshares, the symbolism receiving wide acclaim at the time. He was just as sincere in his love of peace as our President and his advisers are today—but symbols, sincerity and desire won't keep peace! We must actually do tangible things, not once or twice, but over and over again. Otherwise, we may wake up some day and find that a future President has a model gun again on his desk.

Sometimes I wish that we could translate some of the rules which govern friendly intercourse among individuals into the way things are done among nations. Diplomacy had its roots, I imagine, in something known as the art of diplomatic procedure—which very often meant, in centuries past, that while a courtier kissed his sovereign's hand he stealthily caused a knife to be run into his

back. Such little tricks and habits went by the board many, many years ago, and now we put a very much higher premium on being honest and truthful with each other both as individuals and as diplomats.

There are always some people, however, who think that you cannot say an honest thing and make it sound agreeable. In other words, a disagreeable statement is usually more truthful than an agreeable one. If you must do something which everyone agrees has to be done, but have a choice between two ways, one of which is more considerate than the other, the chances are that we will do it the inconsiderate way.

Yet the art of diplomacy was meant to teach us to do what has to be done truthfully, in straightforward fashion, but with courtesy and consideration for those with whom we deal. This requires a certain amount of imagination and the ability to put oneself in the other fellow's place—something which of late we have not always found it easy to do.

Military victories are heady wine, but there was a saying once which an uncle of mine made famous. It went something like this: "Speak softly, but carry a big stick." We carry the big stick today and the whole world knows we carry it, but don't let's forget the other part of President Theodore Roosevelt's injunction: "Speak softly." Many people may be so grateful to us, if we remember this injunction, that some of the knottiest problems of peace may unravel themselves with greater ease.

'Planned' Research Opposed

Discovery of Basic Principles Viewed as Work of Endowments

TO THE EDITOR OF THE NEW YORK TIMES:

In THE TIMES of Aug. 19, Dr. Waldemar Kaempffert, referring to Dr. Bush's report on "Science, the Endless Frontier," takes issue with Dr. James B. Conant on the question of goals of fundamental and applied research, and again cites the success of industrial research in support of his views, as he has previously done on other occasions. Dr. Kaempffert proposes that "large-scale research be organized, planned and directed by a competent board in accordance with industrial principles." From my own experience, I am led to protest Dr. Kaempffert's citation of successful industrial research as research so managed.

One sure way to defeat the scientific spirit is to attempt to direct inquiry from above. All successful industrial research directors know this, and have learned by experience that one thing a "director of research" must never do is to direct research, nor can he permit direction of research by any supervisory board.

Teamwork Necessary

Successful research goes in the direction in which some inquiring mind finds itself impelled. True, goals are set, goals of understanding in the case of fundamental research, and goals of practical accomplishment in the case of applied research. Teamwork increases effectiveness in either case, and the director of research does his part by building teams and seeing that they are supplied with facilities and given freedom to pursue their inquiry. He also insures for them contacts essential to their work, but at the same time protects them from interference or diversion arising from demands of immediate operating needs. He assigns fields of research and broad objectives to the different groups working under his direction, but he must depend largely on those doing the work to find the gaps in knowledge and the opportunities for practical improvements.

Almost all research, as Dr. Kaempffert has pointed out, is fundamental in character, whether it is done by universities or industrial laboratories, but "pure" or basic research directed at understanding nature's laws and expanding our area of scientific knowledge is almost wholly a function of universities and endowed pure research institutes. Very few industrial laboratories can afford to do much pure research. A few large laboratories, of which Bell Telephone Laboratories is one, do some such work in areas of very special relationship to their practical researches. Returns from pure research are usually very long in coming and, when they are realized, almost always react to the benefit of the whole world of science rather than to the special benefit of the institution conducting the research—a situation which gives little inducement to a corporation to support such work on its own account.

Universities a Source

Consequently, industrial organizations must draw very largely from universities and pure research institutes for the advances in fundamental science on which their long-term technical progress depends. They draw, too, from the universities for the supply of men trained in the methods of scientific inquiry by pure science research, and for much of their work prefer men so trained.

It is toward maintaining this supply of new knowledge and trained men that some of the principal recommendations of Dr. Bush's report are directed. His proposal aims to preserve the values of independent research that have been demonstrated to be successful. I grant that, within his plan, research efficiency would be improved by more teamwork than is common in university research.

It would not, however, in my opinion, be improved by more "planning" or management by a supervisory board such as Dr. Kaempffert suggests, "mapping out the whole field of science to reveal gaps in our knowledge." This kind of management of research is not an "industrial principle" of Bell Telephone Laboratories or any other successful industrial research laboratory of my acquaintance and, in my opinion, it is a principle to be avoided.

OLIVER E. BUCKLEY,
President, Bell Telephone Laboratories.

New York, Aug. 21, 1945.

Editorial comment on this letter appears elsewhere on this page.

ORGANIZING RESEARCH

The letter from Dr. Oliver E. Buckley, which appears elsewhere on this page, is important because it comes from the director of an industrial laboratory and because he shares the view of Dr. Conant that what is vaguely called "fundamental" research must be left to the free spirits of universities and foundations. Yet an analysis of Dr. Buckley's argument fails to support his conclusions. When industrial laboratories were first established, inventors of the lone heroic type declared that revolutionary contrivances could never come from hired chemists and engineers. The Germans were the first to disprove that with their development of coal-tar chemistry. Now we are told that fundamental research cannot be conducted by industrial methods.

When the du Pont laboratories developed the theory of polymerization, they obtained nylon as one result. Out of the fundamental research conducted by Bergius on coal came synthetic motor fuels and alcohols. The General Electric Company's gas-filled lamp came out of a fundamental study of low-pressure chemistry and the validity of the laws of radiation for hot wires of all diameters. Dr. Langmuir's studies of surface chemistry, carried out in the same industrial laboratory, deserve to be called fundamental. Probably more fundamental research in photochemistry has been conducted in the Eastman laboratories than anywhere else. The instances could be multiplied. Dr. Buckley argues that such fundamental investigations are conducted because industrial laboratories are organized for profit. Suppose that one of the few great industrial laboratories that engage in fundamental research had found it necessary to develop quantum mechanics for profit. Can there be any doubt that it would have done so, just as the du Pont laboratories developed the theory of polymerization?

Because the profit motive may be uppermost in the minds of industrial scientists, it does not follow that teamwork could not produce results which are important but neither profitable nor patentable. If the scientists who are to conduct cancer research in the newly created Sloan-Kettering Institute in accordance with industrial principles find it necessary to evolve a fundamental theory of growth that can be experimentally verified, is there any doubt that they will make the attempt? Had the extraordinary organization that gave us the atomic bomb been charged with formulating a new theory in physics which might or might not have been profitable, it would probably have been just as effective as it was in solving a largely technological problem. Dr. Buckley thinks that because industrial laboratories must make profits, their principle of teamwork will not work in economically unprofitable investigations.

When Dr. Buckley states that directors of laboratories must leave their staffs to themselves, everybody will agree. But direction in the dictatorial sense is something different from mapping out the whole field of science to reveal gaps in our knowledge that must be filled. A director should do no more than assign research tasks in the light of a map and a plan. No laboratory director can perform his function efficiently without a plan of some kind. The alternative is what we have now in universities—projects which appeal to a board of scientists but which do not fit into a comprehensive plan even in a special field.

AFTER-EFFECT OF THE BOMB

The Tokyo broadcast which announces a mounting toll of life after atomic bombs devastated Hiroshima and Nagasaki cannot be dismissed as fiction. That atomic explosions induce persistent radiations in a bombed area has been maintained by some physicists and denied by others. Probably there is an after-effect, but how intense it is and how long it lasts we do not know. Tokyo's assertion that life is impossible in a bombed area for seventy-five years, that flashlike exposure to ultraviolet rays emitted during an explosion produces burns and blisters followed by dropsy, certainly needs verification, even though it seems medically incredible. That blood counts reveal an alarming decrease in white cells, especially after an explosion, is more probable in the light of studies made to determine the health hazards in uranium plants. Nevertheless a physician will insist on comparing blood counts made before and after an explosion, on correlating these with others made in unbombed areas and on subjecting animals to explosions which will not kill but which will disclose physiological effects. Moreover, it must not be forgotten that Japan has had to contend with malnutrition, exposure and psychic shock. All these break down the body's resistance, and

allowance must be made for all in passing on Tokyo's pronouncement. The questions raised are all new.

Those who accept the Japanese tale will rely on Prof. Harold D. Smyth's report on the elaborate precautions taken in uranium plants to protect workers. No man goes near a pile of uranium during bombardment. The metal is handled by remote control up to the time when plutonium is separated chemically. The pile is shielded by concrete, steel or some other radiation-absorbent. Research conducted in the plants did reveal abnormally low blood counts and these were correlated with overexposure. But Professor Smyth makes it plain that blood counts are not entirely trustworthy criteria.

There is no doubt that powerful alpha, beta and gamma rays dart out in all directions as a bomb explodes. So with neutrons, which are equally dangerous and which may disintegrate surrounding matter, so that it radiates for a time. But we have no trustworthy expression of opinion on that point from the physicists who gave us the bomb. Until they have delivered themselves and until the physiologists have made their studies we can do no more than hope that Tokyo has exaggerated in an effort to arouse world sympathy.

ATOM BOMB FAILS TO EXCITE SAVANTS

N.Y. Times 8-25
Only 1 of 31 Papers at Their
Meeting Here Warns Bluntly
of Dangers It Presents

OTHERS TREAT IT CALMLY

See Merely New Phase to an
Old Problem—Basic Tasks
of Education Are Weighed

By MORRIS L. KAPLAN

Perceptibly unaroused and even philosophical at the imminence of the Atomic Age, 120 scientists, philosophers and theologians discussed yesterday the broad aspects of educating peoples of the world and how to get along with each other.

Of thirty-one papers presented to the opening sessions of the sixth annual Conference on Science, Philosophy and Religion in their relation to the democratic way of life, only one bluntly called the attention of educators to the necessity for forming plans to adapt education to the new world situation created through the atom bomb.

It was not that the savants ignored the tremendous implications inherent in the loosing of radioactive elements. They discussed the matter frequently, but rarely in a manner that would reveal that they were bowled over by its dramatic essentials. Calm, judicial and unexcited, they appeared to deny the newness of anything under the sun, or that they fiddled while the world burned. Their general tone suggested only that a new urgency had been added to an age-old problem.

Man's Mind the Problem

They expressed concern principally over the problem of "making man's mind control his actions to keep him from destroying himself."

Meeting at the Men's Faculty Club of Columbia University, 400 West 117th Street, some of the nation's leading educators in their respective fields sought bridges for cultural understanding in education, economics and government. Their discussions were based on papers written by conference members and those invited to participate.

Elaborating their central theme, they asked how different elements within education could be reconciled; how education could be used as a bridge between cultural groups; whether general education should be basic to all others and whether science and religion had failed to provide adequate integrated cultural values.

More disturbed apparently by the urgency of atomic forces, a refugee scholar who found a haven here in teaching only three years ago, after he escaped from Nazi Germany, offered a concrete proposal on control of the atom. He is Reinhold Schairer, visiting Professor of Education at New York University and executive director of the World Education Service Council, who suggested that a solemn pledge to humanity equivalent to the ancient Hippocratic Oath of physicians be adopted to save civilization from the perils of misused atomic forces.

Declaring that with the advent of the Atomic Age, "scientists begin to speak like prophets and statesmen like preachers," he predicted that science, philosophy and religion would "open the door to the Atomic Age."

Professor Schairer advocated that the pledge be accepted by everyone as a vital principle of living and that school children be required to recite it after the pledge to the flag.

The secret of the atomic bomb, he said, should be handled in the same manner the medical profession handled its scientific knowledge.

"The medical profession," he continued, "in every modern town has at its command poison and bacterias that would suffice to kill whole towns if used for this purpose. Yet these media are used for the benefit of man, not for aggression and destruction. Only the same attitude can save humanity from the danger of misusing the atom forces for selfish and destructive purposes."

"The same attitude alone can also help to develop fully the power of the atom for the service of suffering humanity everywhere."

Wider Sharing of Ideas Urged

Professor Schairer advocated also a wider interchange of ideas between students and teachers across frontiers and pointed out that the best educational job now being performed in Germany was by the presence of the American soldier. He pictured the GI as an emissary of kindness because he was such a "kind person" with children. Germans, he added, were surprised at this, because they associated strength with brutality.

Other speakers agreed that such techniques of sharing should be considered as an integral part of future education and as a device for teaching permanent cooperation between the freedom-loving nations, but were less specific in their proposals.

William Siefritz, Professor of Botany at the University of Pennsylvania, warned against permitting scientists to become the tyrants of the coming era. The modern scientist, he said, was a "high-pressure research man who is no more immune to emotional thinking than is the layman," and "the fact that we are dealing with scholars is no guarantee against bureaucracy."

"Academic imperialism," he went on, "is evident on all sides. The monarchical policies long evident in the medical association now reveal themselves in such other organiza-

tions as that of the chemists, where the tremendous successes of chemical research in warfare have given this group of scientists unheard-of prestige in the scientific world. Such a power in science can become as dangerous as the influence of a political or social group. There exists here a real threat to pure science, as a menace to scholarly life."

Dr. Lyman Bryson, director of education and post-war studies of the Columbia Broadcasting System, who was chairman of the morning session, said it was difficult for the professor to engage in active community life and still have time left in which to do the thinking and research required for his studies.

When the afternoon session's discussion threatened for a time to border on the esoteric, Frank Tannenbaum, Professor of History at Columbia University, brought it down to earth with the remark that the role of the intellectual was a humble one, perhaps secondary, and that a sense of direction must emerge from life's experience itself.

Limitations of Education

When Mark Starr, educational director for the International Ladies Garment Workers Union, asserted that "we all live in the corroding influence of a safety-first atmosphere" and that scientists and educators should climb down "out of the ivory tower," Professor Tannenbaum commented:

Another speaker pointed out that in a "certain country" where intellectuals were subservient, a great war resulted.

Intellectuals dwell in a "false universe," a historian replied, adding that "their trouble is that not only do they write the books, but are the only ones who read them."

Another speaker, who is with the Department of State, predicted that the secret of the atomic bomb would become generally known "in four or five years" and that after that the question of who was to be destroyed by the bomb would depend merely "on who pulls the trigger first."

Therefore, he concluded, we must seek effective means to achieve world peace within the time limit, "or collectivism in death as well as in life is our prospect."

Discussing economics as a bridge for human understanding, Ludwig Mises, visiting professor at the Graduate School of Business Administration, New York University, said it was a fallacy to assume that society was responsible for "the fact that not everybody enjoys the advantages that riches give to a small number of people."

"Society has not only created wealth for those who possess it," he added, "it has immensely improved also the material well-being of those who are considered as poor when compared with the richer strata of society. Those whose income is lower than the average would prejudice their own rightly understood interests if they were to overthrow a social system which makes them much more prosperous than any other realizable organization of society."

Hans J. Morgenthau, associate professor of political science at the University of Chicago, said the goal of political action was success and the goal of moral action was conformity, but that when conflict between ethics and politics arose, success became the ethical goal as well, "and God is always with the stronger battalions, with the party who wins the elections and with the biggest bank accounts."

Columbia Appoints Interim President



Dr. George B. Pegram

Underwood & Underwood

Dr. George B. Pegram, dean of the Graduate Faculties of Columbia University and co-discoverer of one method of slowing down neutrons in order to split atoms, has been named acting president of Columbia to succeed Dr. Nicholas Murray Butler, whose retirement will become effective on Oct. 1, it was announced yesterday.

Dr. Pegram, who has been associated with Columbia since 1900, will serve as head of the university until the board of trustees selects a permanent president. A special committee, headed by Frederick Coykendall, chairman of the board, will do the preliminary sifting of candidates, but is not expected to make any recommendations for several months.

Most of Dr. Pegram's research has been concerned with radioactivity, neutrons and nuclear physics. It was he who announced, in 1939, the splitting of the uranium atom by Columbia physicists. He also designed the special apparatus that made possible the mass production of "heavy oxygen."

WE had the privilege of spending part of the day set by President Truman as one of thanksgiving for victory with the widow of a man who did a lot to arrange for that victory. We escorted Mrs. Roosevelt last Sunday afternoon to a thanksgiving broadcast she made for C.B.S. She was greeted at the studio by Larry Hardy, a C.B.S. program director, who told her the broadcast was to take four and a half minutes. "My goodness, I thought it was two minutes," said Mrs. R., pulling out her script. She sat down at a dead mike and read it off while Mr. Hardy clocked her, at first with an expression of alarm. "Four minutes and ten seconds," he said, sounding relieved. "Oh, I can cut it down," said Mrs. Roosevelt, whose mathematics appeared to us regrettably feminine. "I'll take it as it is," said a man in the room who was identified to us as Lyman Bryson, director of C.B.S. postwar planning and Mrs. Roosevelt's announcer. In the middle of the actual broadcast, Mr. Hardy, watch in hand, made a circle in the air with his right forefinger, and Mrs. Roosevelt, an old hand at radio signals, speeded up a little. At the end, Mr. Bryson, who had introduced her, got off a you-have-just-heard sentence, after which he was shoved away from the mike by an agile man with a mustache who said, "This is the Columbia Broadcasting System." Mr. Bryson explained to us that he hadn't been allowed to say this because he is an executive and not an announcer. "I never announce," he announced. "I did it as a special honor to Mrs. Roosevelt." Several news photographers were badgering Mrs. Roosevelt for a smile. "She sure is a sweetheart," one of them said, in an aside.

Mrs. Roosevelt allowed us to accompany her back to her apartment, and on the way downtown she commented on the cheery atmosphere she had noticed in the city the past few days. "You see so many recent civilians with their new suits, their service buttons, and their girls, looking happy," she said. "The service men no longer have that look of forced gaiety many of them used to have." We got to Mrs. Roosevelt's place, where a Japanese tapestry from her father's collection has been hanging, unjingostically, throughout the war, and asked her how much her husband had known of the progress on the atomic bomb. "He never discussed it with me," she said. "Of course I knew research on the atom was going on. The President would have been much relieved had he known we had it. I've been very much amused by some newspaper comment I read about the tremendous

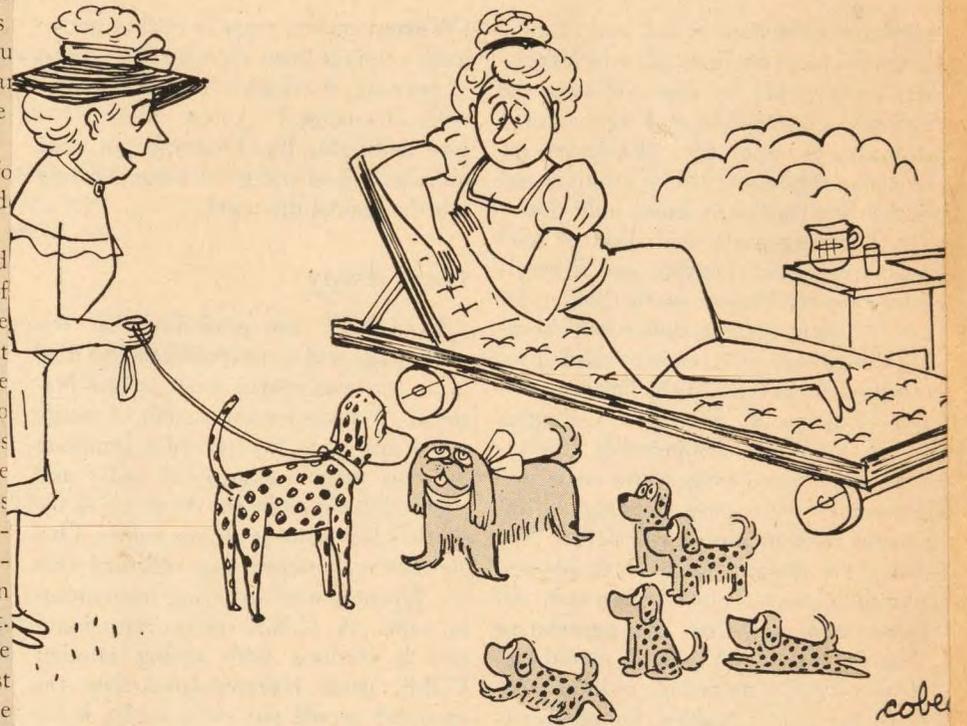
THE NEW YORKER

8-25-45

gamble he took in developing the bomb. I suppose two billion dollars is a gamble, but goodness me, I wouldn't lie awake nights over that! The gamble that made you lie awake nights was whether Germany would develop the bomb first; the real gamble was the one involving human lives. In a curious way, the gamble is something that no Congress and the Administration will realize that the things involve not only ourselves but all over the world. The gamble for peace are as important as the gamble of war."

We asked Mrs. Roosevelt for or two about the late President she said, "When Franklin Warm Springs, he still would give us no dates for the end of anything. But for the first time he was willing to talk about the architecture of peace, the kind of charter we'd write, so I knew he thought the war was won. He and Churchill were very much alike. Churchill was with us when Tobruk fell; instead of being crushed, he immediately turned to 'What can we do?' Franklin was like that. I never knew him to feel there wasn't a way out at the worst times in the war, but as time went on he became surer and surer. He was sure the Russians were coming in against Japan. I remember his telling Anna and me, after Teheran, that he thought the Russians would be ready three to six months after the defeat of Germany. After Yalta, he felt that confidence between us and Russia had grown greatly. He was older after Teheran, and he tired more easily, and we noticed that he seemed to save himself, in the way of seeing people, as never before. He may have caught some bug at Teheran, and he ran a low temperature for a long time, though his stay at Mr. Baruch's seemed to do him good, but when people say he knew he was going to die I think of a dinner we had shortly before he went to Warm Springs—Anna, myself, and one or two others. After Yalta, he looked upon himself as a kind of Near East expert, and at this dinner he said, 'After the war, let's go to the Near East and settle the difficulties there. There are

a lot of difficulties there.' 'I thought we were going to Hyde Park,' I said. 'Then we'll go to the Far East,' he said. 'We'll go to China and fix things there.' I said, 'Let's go to Hyde Park.' There were more things ahead that interested Franklin than anyone else I



N. Yorker 8/18

"You remember Trixie, don't you, Freddie?"

was torn up after the game. Eleven-year-old Crown Prince Akihito seems to prefer baseball to golf.

Fateful Night

IT was cold and windy on the night of January 25, 1939, when Dr. John R. Dunning, the physicist, split the uranium atom at Columbia University and realized that it was possible to release atomic energy. A gale was ripping across the Hudson and rattling the bare vines on the walls of the university buildings. That morning, students taking their mid-year examinations had moved in and out of the Pupin Physics Laboratories, heavily muffled, concerned about their fate in Physics 213 (Thermodynamics) and other such courses. That morning, too, Dr. Enrico Fermi, his colleague, had called on Dr. Dunning in his office on the first floor and the two had gossiped of science and scientists. An instructor had just returned from Princeton with the news that physicists there were talking about a report brought from Europe by the Danish physicist, Dr. Niels Bohr. Before sailing, Dr. Bohr had heard that, in Berlin, Dr. Otto Hahn had discovered barium and apparently other elements of a medium atomic weight in the debris of uranium disintegrated by neutron rays from radioactive material. Dr. Hahn was quoted as having said, "As a chemist, I recognize barium when

I see it. As a physicist, I don't know what this means." What it meant was that the heaviest of elements had been split into elements of lighter weight, with a consequent release of atomic energy. That sounds simple enough now, after six years and two billion dollars. At that time it was a completely new hint as to the structure of matter.

Dunning and Fermi were deeply interested in the question of atomic energy. They had a machine that would measure such energy, and they discussed the question of whether liquid, solid, or gaseous uranium would be best to experiment with. They went to lunch at the Faculty Club and continued to talk about this. They hadn't made up their minds when Dr. Fermi had to leave to catch a train for Washington, where he was to attend a scientific conference. Dunning spent the afternoon in his office, pondering the question. He had arrived at no conclusion when he went out into the wind at six o'clock. He dined with his wife in their apartment, on Claremont Avenue. Toward the end of the meal he decided that solid uranium would be best. He went back, through the wind, to his office. He left his hat and coat there and then went to the research laboratory in the basement. It was a little after seven o'clock. He started preparing his machine, which is fairly simple, as we will describe it: it consists of a holder for radioactive bombarding material, a chamber for the

← over

Tokyo Puts Toll of Atomic Bombs At 190,000 Killed and Wounded

By The United Press.

8/23

SAN FRANCISCO, Aug. 22—Japan gave her first detailed report of the atomic bomb today—70,000 persons killed outright, 120,000 wounded, 290,000 made homeless—480,000 in all known to have been affected—and an unknown number missing from the two dropped by Superfortresses on two of her cities.

These casualty figures were supplemented by the report of a Japanese scientist sent to the scene of one blast to make a detailed investigation. The Tokyo radio quoted his estimation of the explosions: "monstrous, spectacular."

A Domei dispatch recorded by The United Press here said killed, wounded and homeless in Hiro-

shima and Nagasaki totaled 480,000 and added that it was impossible yet to estimate the number of missing. Bodies buried in collapsed buildings still were uncounted.

"Many persons are dying daily from burns sustained during the raids," the broadcast said. "Many of those who received burns cannot survive the wounds because of the uncanny effects which the atomic bomb produces on the human body. Even those who received minor burns, and looked quite healthy at first, weakened after a few days for some unknown reason."

Domei said 60,000 were killed, 100,000 were wounded and 200,000 were homeless in Hiroshima, while 10,000 were killed, 20,000 wounded and 90,000 homeless in Nagasaki.

The first atomic bomb exploded in a shattering heat flash as it dangled from a parachute a quarter of a mile above Hiroshima, releasing mighty whirlpools of energy whose terrific pressure continued for "a considerable length of time," Sutezo Torii, identified by the Tokyo radio as a scientist, reported.

Torii, technician for Japanese Imperial Defense General Headquarters, returned to Tokyo yesterday from Hiroshima, where he made a detailed survey. His description, couched in scientific language that only occasionally descended to human terms, estimated time, speed and distance.

"When the atomic bomb exploded there was seen a flash and white smoke, which gradually formed into a cumulus," he said.

"Persons on the ground who witnessed this monstrous spectacle said when the atomic bomb exploded they saw ripples of circular heat rays. The waves are believed to have continued for approximately two seconds. Explosive pressure after the blast was felt for a considerable length of time. There are about ten minutes between the time houses are destroyed and the time they first catch fire.

Plane Glided In

"The length of time of the explosive pressure depends on the distance, but is believed to be about the same as a sound wave. The relation between the flash and the explosion pressure seems similar to those between lightning and thunder and in proportion to the distance from the center of the explosion. The sound of the explosion of the atomic bomb seems to have been heard at the same time the pressure of concussion was felt.

He described the flash and pressure of the concussion as "extremely powerful," adding that "after the atomic bomb exploded it swiftly scattered elastic energies throughout the air."

Witnesses told Torii that a United States Superfortress appeared in the sky on the morning of Aug. 6. Switching off its engines, it glided in at an altitude of 25,000 feet and dropped the bomb. While the bomb seemed to linger in the air on its parachute, the Superfortress sped away. By the time the bomb exploded the plane had traveled eight miles.

"Three apparatuses attached to the parachute after the bomb exploded fell on the ground north of the target area," his report continued.

"Since the explosive pressure is circular it is ineffective to seek shelter behind any object, although the effect is somewhat weaker than from the front." There also was a difference as to "the severity of burns sustained. The side directly confronting the bomb is serious, while the opposite side is much lighter."

He added that "anything black absorbed the heat more than white, and it left black stains on white clothing. From five to ten minutes after the atomic bomb exploded a black shower was apparent."

30-Kilometer Area Affected

The Domei agency in an English language dispatch reported by the Federal Communications Commission said that since the explosion of the atomic bomb affected an area thirty kilometers in diameter, and practically all the houses in this area were shaken down or knocked down or reduced by fire, it was difficult to count all the dead bodies, many of which were buried under collapsed buildings.

The latest investigation also revealed that the atomic bomb hit

the factory area of Uragami, on the northern side of Nagasaki station, during the Nagasaki attack on Aug. 9. Although topographically parts of the city of Nagasaki did not receive a direct concussion from the explosion, practically all windows and roofs of the various buildings in these parts also were shattered or blasted, with the result that almost the entire city was affected by the bomb, Domei reported.

War Department Is Silent

WASHINGTON, Aug. 22 (AP)—The War Department declined to comment today on a report by the Tokyo radio that 480,000 persons were killed, injured or made homeless by the two atomic bombs.

BRITISH LINK BOMB TO CHARTER DEBATE

Ratification Sponsors Give Equal Stress to Need for Controlling Atomic Weapon

By HERBERT L. MATTHEWS

By Wireless to THE NEW YORK TIMES.

LONDON, Aug. 22—Acting and debating under the formidable shadow of the atomic bomb, both Houses of Parliament today discussed the United Nations Charter in terms that made it clear that virtually unanimous ratification can be expected tomorrow when the debate ends. There were minor criticisms but no fundamental objections.

The debate, in fact, turned as much on the atomic bomb as it did on the charter and Prime Minister Clement R. Attlee, himself, in moving ratification of the charter, struck that keynote.

"I am certain that all of us in this House realize that we are now faced with the naked choice between world cooperation and world destruction," Mr. Attlee said. "It is therefore with the consciousness of six years of war behind us and the possibilities that hang over us in the future that I commend this charter to the House and ask for approval for its ratification."

Mr. Attlee gave a detailed explanation of the Charter, based upon its text.

"Success of the new organization will not depend so much on its exact provisions as on the spirit in which they are worked," he declared. "If a great power is resolved not to carry out the principles of the Charter, then no paper provisions will restrain it."

Collective security, he said at another point, was not merely a promise to act when an emergency occurred but it was "active cooperation to prevent emergencies from occurring."

"What I think is required," he added, "is continuous discussion of international affairs and not sporadic action at a time of crisis."

Speaking for the Opposition, Anthony Eden, who, like Mr. Attlee, was at San Francisco helping to draw up the Charter, could only add his plea to that of the Prime Minister.

"If there ever was a subject upon which there should be unanimity in this House it is this," he stated, "and I hope the House will pledge itself to uphold and apply its principles in our own conduct."

The most outspoken critic in the House was Lieutenant Ben Levy, Laborite, who said the charter was "an ill-fashioned alliance of the great powers piously hoping that they would love and cherish each other for ever and ever, amen." He also criticized the veto power, but he said he would vote for the motion.

Lord Jowitt, in moving ratification of the charter in the House of Lords, said that the secret of the atomic bomb could not be kept indefinitely and that to try to do so would only encourage research in methods of destruction in every country.

"It can only be solved by making effective the great principles that are incorporated in the charter," he added.

Viscount Cranborne, who was also at San Francisco with the British delegation, said:

"It is quite clear that if we do not end war, war will end us and the charter gives us one more chance of putting our affairs upon a better basis."

From the whole tone of the debate it was obvious that the members of both Houses of Parliament were but mildly interested in the Charter but intensely interested in the atomic bomb.

Ukrainian Republic Signs

SAVANTS IN CLASH ON ATOMIC PERILS

Conference Here Is Accused of
Concentrating Too Much
on Physical Sciences

NYT 8/26
By MORRIS L. KAPLAN

Stung by the challenge of a magazine editor who told them a "thousand years" had passed since the first atomic bomb was dropped on Hiroshima, scientists, philosophers and theologians attending the second days' sessions of the sixth annual Conference on Science, Philosophy and Religion hastened yesterday to climb aboard the bandwagon of the Atomic Age.

Accepting the thesis that immediate action on control of atomic energies was vital, if humanity was to survive, poets, artists and natural and social scientists vied with each other to offer possible solutions to man's "insoluble" difficulties. In the heated discussion that ensued, they ignored the formal papers they had prepared and indulged in old-fashioned, pre-atomic dialectics.

A few die-hards objected to the procedure and implied that perhaps a separate conference on the atomic bomb was in order. Most, however, acknowledged the urgency of the problem as presented by Norman Cousins, editor of The Saturday Review of Literature, whose paper on "The Obsolescence of Modern Man" touched off the fireworks.

Stress on Science Opposed

A full-fledged row threatened at one point to upset the seeming accord that had existed between natural and social scientists, when John Collier, former Commissioner of Indian Affairs, protested that social sciences and the humanities were not receiving due attention and that natural, or physical scientists, were hogging the show. Harlow Shapley, director of the Harvard Observatory, denied this in a discussion of the five bills before Congress, sponsored by Dr. Vannevar Bush, chief of the Office of Scientific Research.

If the opening session was marked by a complacency that considered human destruction as an age-old problem not to be attacked with fire and enthusiasm, yesterday's conference appeared tinged at times with a note of hysteria, or what modern scientists are wont to refer to as "crisis thinking."

More than 100 educators met in afternoon and night sessions at the Men's Faculty Club of Columbia University, 400 West 117th Street, to discuss cultural bridges in letters, art, music, natural and social sciences in their relation to the democratic way of life. But Lyman Bryson, director of education and post-war studies of the Columbia Broadcasting System, and chairman of the afternoon meeting, sounded the keynote with a confession that our culture may not bring to bear the influences of art and literature and "free thinking with sufficient impressiveness to prevent destruction of civilization."

"Ivory Tower" Decried

Referring to a paper offered by Milton C. Nahm of the Department of Philosophy of Bryn Mawr College, dealing with communication as a cultural bridge to understanding, Dr. Bryson questioned whether "compartmentalization" was valid, in view of recent happenings. Unless we can discuss what contributions art and letters can make to survival, "we are still in the ivory tower," he said.

Pointing out that we may be in even greater peril today than just after Pearl Harbor, he asked whether "we are wasting our time talking about philosophy."

Mr. Cousins responded that we must be concerned with basic phi-

losophy "to the end of human survival" and that he was not urging the conference to disband.

He urged his colleagues, instead, to do their utmost to inform the public that a new era has been brought about by the atomic discovery and that "man's survival on earth is now absolutely dependent on his ability to avoid a new war."

"With the Atomic Age," he said, "man now has it within his grasp to emancipate himself economically. If he wills it he will be in a position to refine his competitive impulses. He can take the step from competitive man to cooperative man. The same atomic and electrical energy that can destroy a city can also usher in an age of economic sufficiency."

The other alternatives, he declared, were the destruction of modern civilization and all progress, permitting man to revert to his condition in society in 10,000 B. C., or the invention of a "solvent" with which we might "equate" the atomic bomb.

Says New System Is Essential

Plans for international cooperation made at San Francisco are no longer valid, Mr. Cousins asserted. "We are building soapbubbles," he said, "if we expect this problem to be automatically solved by having America, Britain and Canada keep the atom bomb a secret to themselves. We must not forget that we were not the only horse in the atomic derby; we just happened to finish first. The others will be along in due time."

He suggested that the current newspaper date-line, 1945, was inaccurate and should read 2945, "because a thousand years have passed since the dropping of the atom bomb." Such is the urgency of the problem, he observed, that it is no longer possible to plan leisurely for world cooperation. Man has leaped centuries ahead without being ready to face the consequences, he insisted.

Calling for the establishment of a world government, he maintained that the political question was one of adjustment from "national man to world man." Humanity, he continued, must recognize the flat truth that the greatest obsolescence of all in the Atomic Age is national sovereignty.

Danger of New Wars Seen

Far from banishing war, the atomic bomb in itself will constitute a cause for war, he predicted. In the absence of world control as part of world government it will create universal fear and suspicion, he added, and "what a temptation for the blitzkriegers!"

Industry, he warned, will demand the right to carry on its own experiments with atomic energy. Why should not science and knowledge, he asked, be extended to other needs, principally humanity's health. "What a fantastic irony that organized science knows the secret of the atom but as yet knows not a fig about the common cold," he commented.

Supporting Mr. Cousins' concepts, Dr. Robert MacIver, chairman of the Department of Sociology at Columbia University, pointed out that world government does not depend on cooperation between capitalistic states alone but is a question of relationship between all countries.

A representative from the Department of State declared that warproof relationships must be established among all the peoples of the world. Axis schools in Latin America, he pointed out, are still heavily financed and better equipped than any that come under American influence. In numbers, he added, the ratio is four to one against democratic institutions there. The pioneering instinct, latent in this hemisphere, he said, can be used as a cultural bridge.

Discussing the role of the artist in modern society, Dr. Douglas Bush, Professor of English at Harvard University, deplored the fact that the majority, after leaving college, are content with magazines and current best sellers and no longer read "great literature." He ascribed to the authors some

of the blame for the failure of modern literature to meet high standards.

"A large proportion of modern literature, especially poetry, is itself written by and for sophisticated highbrows," Dr. Bush said. "If the scientists nowadays have everything their own way and have suspended the poets as guides and oracles, it is hardly to be wondered at. Even the poets bow down to them."

William G. Constable, curator of the Department of Paintings of the Museum of Fine Arts in Boston, criticized the artist for remaining aloof and declared his work should have roots in the activities of the day.

Ad Copy as "Venal Poetry"

S. S. I. Hayakawa, Associate Professor of English at the Illinois Institute of Technology, Chicago, complained that most talented writers of today, who might have been good poets, are writing advertising copy. Describing the persuasive, skilfully written advertising copy as "venal poetry," he said that it occupies 130 out of 200 pages of each issue in "most class circulation magazines."

Advertisers invoke "all the symbols of the home, of mother, of the American way of life, of morality and of the Christian religion in order to sell a box of soap flakes," he remarked. As a result it is impossible for writers "to say anything with enthusiasm or joy or conviction." If they do, they run into the danger of "sounding as if they were trying to sell something," he said.

Stimulated by discussion of atomic energy, most of the artists present, including Walter Pach, author of books on painting, sought to interpret their specialized fields in terms of what each one should contribute broadly to humanity if civilization is to survive.

Those who disagreed at first with Mr. Cousins' thesis either acknowledged that they approved or remained silent. Discussions on similar themes will continue today.

Atom Secret Refused To Truman as Senator

By MERRIMAN SMITH.

United Press Staff Correspondent.

WASHINGTON, Aug. 27. — Harry Truman tried hard but he couldn't find out back in 1942 and 1943 what was going on at those three mysterious Army plants in Tennessee, New Mexico and Washington.

It is possible now to tell how the President, as a Senator from Missouri heading the War Investigating Committee, demanded in vain an explanation of what the Army was doing with several millions of dollars which Congress was dishing out for secret experiments.

The experiments, which were kept from even the hard-working beagles of the Truman committee, dealt the atomic-bomb development program.

Late in 1942, Mr. Truman became alarmed at what he considered fantastic expenditures to build and operate the three plants about which the War Department had erected a wall of secrecy. He

decided that his committee should be told at least some of the story.

First Mr. Truman sent Harry Vaughn (now Brig. Gen. Vaughn, his military aid) to one of three plants as a Truman committee investigator. But even with the committee's backing Gen. Vaughn couldn't force his way through the front gate.

Mr. Truman persisted. He sent his trusted friend, U. S. Marshal Fred Canfil of Kansas City, to another plant. By dint of considerable talking Mr. Canfil got inside for a quick look.

But atomic-bomb production, it developed, is so complex and so purposely spread out that Mr. Canfil couldn't make any progress. One department didn't know what the next was doing.

Mr. Canfil did get enough of an eyeful to report to the Truman committee that some mighty big business was going on in those three plants. Yet the Army could be building rockets to the moon so far as any real information he could discover.

Plea Made by Stimson.

One report said Mr. Truman himself turned up next in the vicinity of a plant and accosted an atomic-bomb worker. Mr. Truman asked him what he was working on.

"Bubble gum," was the reply.

By this time Secretary of War Henry L. Stimson had learned of the Missouri Senator's efforts and went to his office on Capitol Hill. He pleaded with Mr. Truman to call a halt and to trust the War Department's judgment that the probable results would be well worth the expenditure of a couple billion dollars.

Mr. Truman's high personal regard for Mr. Stimson's judgment and honesty caused him to call off the investigation. The Truman committee's efforts to learn the secret of the atomic-bomb program were halted.

President Truman was notified of the successful New Mexico test of the atomic bomb while at the Potsdam conference. The day was set for its first use against Japan. It was to happen while the President and his party were aboard the cruiser Augusta returning to this country.

Bad weather and other unsatisfactory technical conditions delayed the first atomic bombing by three days. Mr. Truman admitted later that he was "on pins and needles" until news of the Hiroshima raid reached the Augusta.

Then Mr. Truman talked to his staff about the potentialities of the epochal achievement. He spoke time and again of the tremendous industrial potentialities of atomic power and of its possible future development to perpetuate peace.

He spoke of the day when, with all nations living together peacefully and with war virtually outlawed, the secret of the atomic bomb could be elevated from a thing of secrecy to a development known to and benefiting all the world.

HIROSHIMA GONE, NEWSMAN FINDS

City Vanished Under Single Blow of Atom Bomb, He Says After Tour of Area

The following dispatch was written by Leslie Nakashima, employed by The United Press in Tokyo at the outbreak of the war. It had been expected that he would be interned, but the police left him free.

By LESLIE NAKASHIMA

TOKYO, Aug. 27 (Delayed) (U.P.)—Hiroshima was destroyed at one strike by a single atomic bomb dropped by a Superfort on the morning of Aug. 6.

There is not a single building standing intact in the city, which had a population of 300,000.

The death toll is expected to reach 100,000, and people continue to die daily from burns suffered from the bomb's ultra-violet rays.

[United States scientists say the atomic bomb will not have lingering after-effects in a devastated area.]

I arrived at Hiroshima at 5 A. M., Aug. 22, to find out about my mother, who lived in the outskirts of the city.

Alighting from the train, I found that Hiroshima station—once one of the largest in western Japan—no longer existed. The only thing that was left was a concrete platform.

Dumfounded by Destruction

Fragments of brick walls scattered about testified to the severity of the destruction.

Getting out into the open, I was dumfounded at the destruction before me.

The center of the city immediately south and west of the station was razed and there was a sweeping view to the foot of the mountains to the east, south and north of the city.

In other words, what had been a city of 300,000 had vanished.

As far as the eye could see there were skeletons of only three concrete buildings standing in the city's chief business center. They were a seven-story former department store, a five-story newspaper building and a two-story bank.

Except for parts of brick gates and burned-out underground air raid shelters, there was no trace of private buildings. I also found very little corrugated iron left. This was significant, inasmuch as every other Japanese city hit by firebombs has been found littered with corrugated iron after the fires had burned out.

The sight before me as I headed for the outskirts of the city where my mother lived was unbelievable. It was unbelievable because only a fortnight before the bombing I had seen the city intact when I evacuated my wife and two daughters to central Japan.

Except for one or two bombs dropped on separate occasions by B-29's, Hiroshima had not been subjected to heavy incendiary attacks.

Damage Extends for Miles

However, as I trod my way through the debris, wondering if my mother was still alive, I realized that in reality Hiroshima had been destroyed through the stupendous destructive power of a single atomic bomb.

Two miles from the center of the city I found dwellings heavily damaged. Many of them were crushed, as if from heavily descending pressure. Another half-mile farther I found walls of dwellings smashed in and the roofs shattered, attesting to the air pressure the bomb created. Such was my mother's dwelling.

But I found my mother safe. She had been weeding grass in a relative's vegetable field about two miles southeast of the city when she saw the flash.

She immediately threw herself face down on the ground. The next moment she heard a terrific explosion. Arising she saw columns of white smoke rising from all parts of the city, high into the sky.

She said she started running away from her home as fast as she could, because she didn't know what would happen next.

A school in the suburbs near mother's home has been converted into a field hospital to care for people who suffered burns. The majority of these cases is believed hopeless.

Many of the victims are unidentifiable.

Even now two or three patients are dying daily at this one hospital.

Even at that locality, some three miles from the city, leaves of vegetable plants are scorched, and it was feared plants eventually would die.

Japanese Reports Doubted

OAK RIDGE, Tenn., Aug. 30 (AP)—Japanese reports of deaths from radioactive effects of atomic bombing are pure propaganda in the opinion of Maj. Gen. Leslie R. Groves, commanding general of the Manhattan District.

Studies by scientists in this country do not bear out the death reports, General Groves said at a press conference here today.

"While the people of the United States would be committing suicide if work on the atomic energy were not continued," General Groves said, "I believe commercial uses of this force are probably decades away."

"The atomic bomb is not an inhuman weapon," General Groves told workers and military personnel in a surprise visit to the project yesterday.

"I think our best answer to anyone who doubts this is that we did not start the war, and if they don't like the way we ended it, to remember who started it," he said.

Dead Nagasaki Seen From a B-17; Atomic Bomb Wiped Out Center

By W. H. LAWRENCE

By Wireless to THE NEW YORK TIMES.

ABOARD A FLYING FORTRESS OVER NAGASAKI, Japan, Monday, Aug. 27—Burned, blasted and seared, Nagasaki looked like a city of death today as this Flying Fortress brought newspaper and radio reporters to see at low level for the first time the effects of the atomic bomb dropped on this Japanese port of 253,000.

An interior section of the city was literally disintegrated from the impact of this secret weapon, which was used against this urban industrial center on Aug. 9—one day before the Japanese Government broadcast its offer to surrender.

This is destruction of a sort never before imagined by man and therefore is almost indescribable.

Block after block of buildings, which were jammed together so closely that Nagasaki looked from the air in peacetime like a sea of roofs, has disappeared.

The area where the bomb hit is absolutely flat and only the markings of the building foundations provide a clue as to what may have been in the area before the energy of the universe itself was turned loose to destroy the industrial potential of Japan.

When we first came over Nagasaki this morning just before 9 o'clock, there was not a living thing to be seen in the area along both sides of the Urakami River

where the bomb damage was concentrated.

We have now been flying over the city for nearly an hour at such a low level that the curiosity of the Japanese residents in the outlying sections has been aroused and they are pouring into the streets by the hundreds to watch our circling plane.

Down in the harbor area, well beyond the area of danger of impact from the atomic bomb, there is an Allied prisoner of war camp and in it we can see scores of demonstrating prisoners, some of whom are waving the tricolor of the Netherlands. We have just dipped in low and dropped some cigarettes to them.

We would like to land and get from these prisoners their reaction to the atomic bomb that exploded so close, but unfortunately there is no airfield near by where this B-17 could be set down.

[A National Broadcasting Company correspondent on the flight over Nagasaki said two prisoners' camps in the area seemed to have been shielded from any effects of the atomic bomb blast by mountains that surrounded them.]

Damage Exceeds Russian Cities'

This trip, arranged by the United States Army Strategic Air Forces, is the first opportunity news men have had to see at first hand the destruction wrought by the atomic bomb.

This correspondent, who has seen the worst damaged cities of Russia and of Poland, was stunned by the sight of Nagasaki below him. About 50 per cent of the town seemed to have been completely wiped out, and the destruction in that area was worse than any the writer had seen in Stalingrad or Warsaw.

An arms factory is nothing but a mass of twisted girders. The wooden tinderbox houses which were jammed eye to eye have disappeared and all that remains are fragments that from the plane look about the size of match sticks.

It is obvious that the flash when the bomb went off was great and covered a large area.

On the sides of a rugged, tree-covered hill that is close behind Nagasaki whole sections of forest have been burned off.

The winding Urakami River flows almost exactly through the center of the destroyed area. It was clear from the view we have had today that it was no barrier to the spread of fire and destruction.

We have as yet no accurate report on the number of persons who were killed and injured in the atomic bomb blast, but there is no doubt that industrial Nagasaki was completely wiped out by the single bomb.

Ridge Saved Part of City

OKINAWA, Aug. 26 (AP)—Lieut. Col. Clay Tice Jr., of Phoenix, Ariz., reported today that street cars were running in part of Nagasaki yesterday even though much of the Japanese city was flattened by the atomic bomb dropped on it Aug. 9.

Colonel Tice and Flight Officer Douglas C. Hall of Anamosa, Iowa, Fifth Air Force pilots, made forced landings on Kyushu Island yesterday and became the first Ameri-

cans to land on Japanese home soil since hostilities ceased.

Colonel Tice said he flew over Nagasaki at 1,500 to 2,000 feet.

"I flew over another Japanese city that looked just as bad and I've seen cities in France that looked as bad," he reported.

"Part of Nagasaki was completely flattened with one area bare, even of rubble, like an open field—probably where the main bomb blast was felt. But part of the city is protected from that area by a high ridge and in that part I could see street cars operating, school buildings standing and people moving on the streets."

Tice and Hall were on a reconnaissance mission when Flight Officer Hall's P-38 developed fuel-system trouble and they had to land at the Mittagahara airstrip on Kyushu. A B-17 flew in gasoline for Hall's plane and all returned safely to their Okinawa base.

"Radioactivity" Discounted

The reports by the correspondents on the B-17 flight and by Colonel Tice regarding activity seen in the Nagasaki areas that were not directly affected by the atomic bomb blast, indicated that Japanese accounts last week of continued fatal "radioactivity" from the atomic bombing might have been somewhat exaggerated, observers here noted last night.

Japan Beaten Before Atom Bomb, Byrnes Says, Citing Peace Bids

By The Associated Press.

WASHINGTON, Aug. 29—Secretary of State James F. Byrnes challenged today Japan's argument that the atomic bomb had knocked her out of the war.

He cited what he called Russian proof that the Japanese knew that they were beaten before the first atomic bomb was dropped on Hiroshima. Foreign Commissar Vyacheslav M. Molotov informed the Americans and British at the Berlin Conference, Mr. Byrnes said, that the Japanese had asked to send a delegation to Moscow to seek Russian mediation for the end of the war—an act that Mr. Byrnes interpreted as proof of the enemy's recognition of defeat.

He disclosed that Generalissimo

Stalin himself had rejected this Japanese effort to negotiate a peace by declaring that it was too general for him to act on. Then, about the time of the Berlin conference, the Japanese proposed that Prince Fumimaro Konoye head a delegation to seek Russia's mediation, but the Berlin declaration for unconditional surrender put an end to that move.

Mr. Byrnes said that he could not say what had motivated the Japanese surrender but that history would record the information imparted by the Russians in Berlin. He made it clear that he believed that the men who had fought the war up to that point in the

Pacific and Asia deserved full credit for victory.

Mr. Byrnes expressed his views at a news conference mention of the atomic bomb. To the extent that the bomb had facilitated the surrender, he said, it saved the lives of hundreds of thousands of American soldiers and it saved the lives of hundreds of thousands of Japanese boys and millions more of Japanese people. It saved far more Japanese lives than were lost, Mr. Byrnes declared.

Speaking as a member of President Truman's special committee on atomic bomb policy, Mr. Byrnes said that the committee had completed and turned over to the President a memorandum for Congress on the form that legislation for control of the bomb might take.

Mr. Byrnes' disclosure that Premier Stalin had rejected the Japanese mediation bid because it was too vague explained one point that had not been clarified by any top Government official. During the Berlin Conference, Acting Secretary of State Joseph Grew said that this Government had received no Japanese peace offer, but only some feelers. Afterward, when Moscow revealed the mediation proposal, the question was raised whether that did not constitute a real Japanese peace move.

Mr. Byrnes' report brings out that the Russians in Berlin merely informed President Truman and himself of the Japanese activity but did not in any way present a Japanese peace offer.

ATOM BOMB DID IT, ENEMY PRINCE SAYS

Premier Adds That Emperor's 'Love of the People' Also Prompted Surrender

It really was the atomic bomb and the Emperor's "love of the people" that made Japan decide to call it quits, Premier Naruhiko Higashi-Kuni told his Cabinet and members of the Lower House of the Japanese Diet yesterday.

The statement was made by the Prince to the Japanese leaders at a roundtable conference in the Premier's residence, the Domei agency said in a dispatch intercepted by the Federal Communications Commission. Today the Premier is scheduled to hold a similar conference with members of the House of Peers.

One purpose for convening the Diet on Sept. 4, the Premier declared, was to "clarify frankly" the reasons for Japan's capitulation. The Diet proceedings, the Premier emphasized, "will be watched by the entire world."

Home Front in Confusion

General Sadashi Shimomura, Minister of War, said in a Tokyo broadcast yesterday that while he could readily understand the great confusion and uncertainty in the minds of all Japanese, he could not condone the intention of some citizens to "take disgraceful actions."

General Shimomura, discussing Japan's post-war prospects, made his first radio address to the people since his new appointment. The broadcast was recorded by the Federal Communications Commission.

The War Minister said that the sudden turn of recent events had left more confusion on the home front than on the fighting fronts. He added that though the decision of the Emperor to surrender had first moved him to "bitter tears," he and his fellow men must obey the imperial rescript to the letter.

General Shimomura added: "As long as Japan has accepted the provisions of the Potsdam Declaration, making complaints later or being fretful is certainly an attitude unbecoming the people of a great nation. Not only that, when the provisions of the declaration are being enforced * * * [the] taking of a hostile attitude against the foreigners, or showing disorderly manners must be condemned."

A 'New' Japan Urged in Press

"Whatever terms the Government has accepted, even though there may be points at which we may not see eye to eye from the standpoint of our characteristic traditions and customs, we must, for the future of our nation, have discretion and avoid any act of rashness."

"Moreover, we must not be carried away by our feelings and must not hide or destroy weapons which we are to turn over. We must honorably and without regret hand over whatever we must in an orderly and systematic manner. Thus, it is necessary and imperative to have the foreigners confirm the beauty and the noble moral sense of the Japanese spirit."

Tokyo's newspapers reported that the popular will was to "recreate an entirely new Japan rather than rehabilitate it."

English broadcasts directed to the United States by the Tokyo radio quoted the newspaper Asahi as having said that Japan's current situation "must be calmly reflected upon without bitterness and without the pettiness of blaming any individual amidst ourselves."

"We all are to share the common loss and destiny," the paper continued. "It is at the same time sincerely desired that the United States occupational troops will constitute themselves as a strong overwhelming contribution to the security of permanent peace of the world, for which they are to stand."

NYT 9/2

UNO WILL GET DATA ON THE ATOM BOMB

Charter Gives Security Council Jurisdiction Over Weapon, Stettinius Indicates

By HERBERT L. MATTHEWS
By Wireless to THE NEW YORK TIMES.

LONDON, Sept. 1—The United Nations Charter, as drawn up at the San Francisco Conference, will cover the problem of the atomic bomb, Edward R. Stettinius Jr., chief United States representative to the United Nations Organization, said today at his first press conference since his arrival in Britain. He added, however, that the new weapon made it more necessary than ever to achieve "the speedy creation of the United Nations Organization to keep the peace of the world."

As soon as the Security Council of the UNO is functioning properly it will appoint a military staff committee, he continued. This group will deal with all factors involving the use of force, including atomic bombs, and will report its recommendations to the Security Council.

Mr. Stettinius said that he had had long talks this morning with Ambassador John G. Winant and Dr. Benjamin Gerig of the State Department, who represented Mr. Stettinius the last two weeks, when the UNO executive committee met. They brought him up-to-date on the work accomplished. Mr. Stettinius said that he was "delighted with the progress that has been made."

The former Secretary of State would not commit himself or Washington on a permanent seat of the UNO but said he was "ready to consult" with representatives of other nations on this point, which would indicate that he had definite ideas on the subject.

Mr. Stettinius has set up headquarters at 20 Grosvenor Square, the building Gen. Dwight D. Eisenhower used before D-day. The executive committee of the UNO will continue to meet in Church House, Westminster, and so will its subcommittees, which have just been constituted.

The United States delegate said that he intended to stay here until the executive committee finished its work. He hopes to remain until the first meeting of the preparatory commission. This commission, which is the penultimate step before constituting the General Assembly, can be set up as soon as twenty-nine nations have ratified the Charter—the five main powers plus a majority of the other countries.

Mr. Stettinius said he thought that it would be necessary for the preparatory commission to hold a brief meeting, perhaps in a few weeks, and that the idea of constituting the General Assembly directly would not be feasible since many countries would doubtless want to change the personnel of their delegations for the Assembly.

"I have dedicated myself wholly to the UNO," he said, "and have no other plans or objectives at the present time."

Two weeks of discussions here have made it clear that the type of leadership he brings, backed, as it is, by an almost unanimous American public opinion, is highly necessary. It is obvious that the situation of 1919 and the League of Nations is now exactly reversed, with the United States playing a leading role and bearing primary responsibility for seeing the UNO through.

The English, French and others who had long experience with the League approach the UNO with some skepticism and with a desire to see how it is going to work out before they get enthusiastic. Russia is wary. No other public in the world has been educated to the Charter as have Americans nor has it been publicized to such a great extent in any other country.

The delegates have demonstrated earnestness and sincerity in the past few weeks, but enthusiasm and energy have been somewhat lacking. It is felt that Mr. Stettinius can supply these qualities.

Soviet Hints Race for Atom Bomb; Pooling of Data for Peace Urged

By The United Press.

MOSCOW, Sept. 3—The magazine New Times assailed today some sections of the American press for allegedly advocating that the United States "secure world mastery by threatening use of the atomic bomb," and warned that other nations would soon invent weapons equally potent.

The article, the first detailed analysis of the atomic bomb's significance to appear thus far in the Soviet press, said that the missile's development made lasting peace and security imperative. It urged international pooling of atomic knowledge as "the most effective method of mutual understanding of all freedom-loving nations."

Characterizing the bomb as "one of the greatest inventions of modern science, fraught with enormous consequences in all fields of human

life," the article, by M. Rubinstein, said:

"At the same time, it is clear to all right-thinking men that the discovery does not solve any political problems internationally or inside individual countries. Those who cherish illusions in this respect will suffer inevitable disappointment."

The article bitterly attacked the "Hearst-Patterson-McCormick press" for its alleged arguments that the United States use the threat of the atomic bomb to enforce its will in international affairs, and said:

"These flagrant imperialists forget history's lessons. They ignore the collapse of Hitlerite plans for world hegemony, which were based

on intended utilization of temporary superiority in technical development."

The article said that "many other countries have scientists who studied the problem of splitting the atom and who will work with redoubled energy to invent weapons as good or better." It approved suggestions to vest the control of atomic energy in an international body, "since the fundamental principles are well known and henceforth it is simply a question of time before any country will be able to produce atomic bombs."

In addition to the gravest danger threatening humanity, "should aggressors seize control of this terrible weapon," Mr. Rubinstein said that unlimited economic abuses were possible by exploitation of atomic energy productively under conditions of "capitalist monopoly."

He said that the latter would cause "monstrous mass unemployment and permanent elimination of millions of miners and other industrial workers and intensification of monopoly rule."

Japan Still Censors Bomb News

TOKYO, Sept. 1 (Delayed) (AP)—Japanese newspaper men who had visited Hiroshima said today that the atomic bombing of that city paralyzed persons living ten miles away and that many of those dying from wounds originally received a burn only half an inch wide.

These news men still were prevented by censorship from telling the whole story to their own people.

Masayoshi Murakami of the Yomui Hoshi said that even the slightest burn from the atomic bomb spread throughout the victim's body, eventually causing death. Many are dying even now, he said.

Murakami said that he talked with several who witnessed the surprise attack on Hiroshima. One man gave a coherent account and displayed a half-inch burn on his arm, the news man said. "The burn spread up his arm and throughout his body. Two weeks later he was dead," Murakami added.

He said that witnesses had paid little attention to the plane that had dropped the bomb because they were accustomed to 100-plane attacks, "and, furthermore, the people expected raids only against cities the Americans had announced for destruction."

Nagasaki Plant Life Revives

SAN FRANCISCO, Sept. 3 (U.P.)—The Tokyo radio said today that plants had begun growing again in Nagasaki amid the devastation caused by the atomic bomb on Aug. 9.

Tokyo, quoting scientists from the Kyushu Imperial University, said that shoots of plants were found during "experiments to determine whether living creatures were able to exist or not in the areas struck by the atomic bomb."

The broadcast said that the bomb had three types of effects on the human body: (1) Instant death, (2) symptoms similar to dysentery and eventual death, and (3) bleeding gums, falling hair and throat ulcers resulting in death.

The blood count of the victims decreased to 200 to 300 white corpuscles per cubic centimeter, the broadcast added, and "clinical study" revealed severe damage to bone marrow.

American Visits Hiroshima Ruins

The first atomic bomb, dropped on Hiroshima on Aug. 7, "leveled a three-mile square area so completely that there is not one salvageable piece of tin or steel girder

left," blackened every blade of grass and denuded every tree of leaves and small branches for six miles around, Guthrie Janssen, correspondent for the National Broadcasting Company reported last night.

Mr. Janssen, who had spent a day in the ruins of Hiroshima, described it as "the most terrible scene of human destruction in the world," a hundred times worse than the rubble of Berlin.

PEPPER FOR SHARING OF ATOMIC SCIENCE

PARIS, Sept. 3 (Reuter)—Claude Pepper of Florida, member of the United States Senate Foreign Relations Committee, strongly advocated today the pairing of Germany to a country "the size of France in population," the lowering of international trade barriers, including the elimination of the sterling bloc and British Empire preferences, and the placing of the atomic bomb at the disposal of the military staffs committee of the United Nations.

"We want to get away from artificial trade restrictions," he said. "I am hoping that in the next few weeks or months there will be an international conference to find a way whereby preferences can be eliminated."

"The future is going to be an age of cooperation not only in keeping the peace but in raising the standard of living," he continued. "The war has shown us what cooperation can do; we must keep it up in the dangerous days of peace which lie ahead."

Mr. Pepper said that he thought the atomic bomb would be a force for peace, adding: "The United States does not want to monopolize the atomic bomb. I am confident that the knowledge of its construction will be given to the military staffs committee of the United Nations. I think that is what should be done."

Two Kinds of Atomic Blast

By HOWARD W. BLAKESLEE

Associated Press Science Editor

The British official report on the atomic bomb in details received yesterday revealed that there are two kinds of atomic explosions, one the city-destroying type, the other only about as powerful as ordinary explosives.

The low-power explosion has important implications for world safety in the promise that in producing atomic power for peace the engineers will deal with a force that is not much greater, in destructive capacity, than the accidents in steam and gasoline power plants.

The two kinds of atomic explosions depend, respectively, on fast neutrons for an atomic bomb and slow neutrons for atomic power.

Fast neutrons are uncharged particles that travel at thousands of miles a second and with energies of millions of volts each. Slow neutrons drop to energies of only a few volts or even fractions of volts and also to a few miles a second in speed.

These slow neutrons are about ten times more effective, however, than the fast kind in producing the splits of cores of uranium or plutonium atoms.

Their slowness prevents their use in an atomic bomb. They would start the explosion without difficulty but before they could spread to detonate the entire atomic charge the expansion would separate portions of the atomic explosive. This separation would end the reaction. There would be an ordinary explosion.

A peculiarity of the atomic explosives, uranium 235 and plutonium, is that they are safe until the instant when more than two pounds are brought together into a single, closely packed mass. The slow neutron explosion would separate this mass too soon.

The fast neutrons, however, work in millionths of a second and spread so fast that they ignite all, or nearly all, the atomic explosive.

The huge plant in the State of Washington that converts common nonexplosive U-238 into plutonium uses slow neutrons to produce its transmutation reactions. It is possible to control the slow neutron reactions so that they are safe from explosions.

Fast neutrons will not even start the reactions of the Washington plant, even when a ton of pure common uranium is concentrated. The fast neutron explosive effect becomes possible only when the rare U-235 is extracted from common uranium and concentrated into masses.

N.Y.T. 9/2

The Challenge: One World or None

**'We are in a race with our technologies;
with our mounting capacity to destroy.'**

By **RAYMOND B. FOSDICK**

GIBBON remarks that the greatest theological controversies which racked the Roman Empire and affected the peace of millions turned on the question whether a certain word should be spelled with one diphthong or another. Today we have suddenly been projected into a situation where no controversies that affect peace can be tolerated, whether they relate to diphthongs or anything else. Somehow or other we have got to come to terms with our atomic bombs. And those terms must be reached quickly. Time does not wait. The age-old emotions of hatred and intolerance have at last been armed with weapons by which man can achieve his own complete destruction in one burst of universal fury.

The supreme question which confronts us therefore—the question to which all other problems are merely incidental—is whether our new technology can be brought under control. Is man to be the master of the energies he has created or is he to be their victim?

We knew, of course, that the techniques of war were reaching a peak of destructiveness which modern civilization could not long survive. We knew that another war might easily bring our institutions and the painfully accumulated apparatus of human existence to the verge of cataclysmic ruin. But we were not prepared for the possibility of complete annihilation—the ending of our civilization with a shattering abruptness—which the two bombs dropped on Hiroshima and Nagasaki now portend.

Nor were we prepared for the picture which Gen. H. H. Arnold, head of the Army Air Forces, gave us the other day of the imminence of pilotless missiles directed unerringly from any spot on the world's surface to any other spot, carrying improved atomic explosives "destructive beyond the wildest nightmares of the imagination"—weapons which, he said, were "ideally suited to sudden unannounced attacks in which a country's major cities might be destroyed overnight by an ostensibly friendly power."

IT is to this end that research is being feverishly rushed in laboratories here in the United States and doubtless abroad. "None of these weapons," said General Arnold, "is visionary or merely possible. They are probable almost to the point of inevitability. If we have another war, if another aggressor arises to strike the peace-loving nations, it will be with things like these that he strikes."

This is the point in human destiny to which all the glories and toils of the past have at last led us. These are the gifts which science has suddenly dumped in our laps—dumped in the laps of a race that is utterly unprepared, in terms of ethics, law, philosophy, economics, politics and government, to meet the problems which they present. There is little wonder that to many ears comes the sound of the tramp of doom.

But this is not a time for defeatism. Around the world men of all races and

faiths will rise to the challenge. In the midst of our deliberate preparations for self-obliteration, we say to ourselves with passionate emphasis that it need not and shall not occur. Like a man torn in an impulse to commit suicide, we struggle with ourselves, hope and aspiration fighting with maniacal impulse—Jekyll wrestling with Hyde. Although in 5,000 years of recorded human history we have never succeeded in stopping war, we promise ourselves we shall stop it now—in this generation. In spite of the fact that weapons once invented—from cavalry and gunpowder down to TNT and flame-throwers—have always been employed in subsequent struggles, we highly resolve that atomic bombs shall not be used again.

THERE is something inspiring about this determination. Confronted by the promise of death to our civilization, we insist upon life. In the face of a crisis more ominous than anything the race has ever met, we reaffirm our ability to master it. We have few analogies from the past to encourage us, and in a real sense the cards are stacked against us. But we will not give up hope. We believe we can abolish war because without that belief we shall succumb to a senseless horror and blow ourselves and our civilization into drifting dust. And surely, if intelligence can contrive a fate as disastrous and complete as these new weapons now promise, that same intelligence, backed by the spiritual forces of mankind, can bring our technology under control and make it the servant and not the master of the people.

That is the faith upon which we stake our expectations of a decent future. But with what works is that faith to be backed up? What are the steps that will lead us out of this jungle of untamed powers?

In trying to answer this question we are on uncertain ground. Our social thinking is so far behind our mechanical inventions that anything we do is bound to seem like extemporization. Our first defense must inevitably be the United Nations Organization. It is far from perfect, but it is at least a beginning. Had we known at San Francisco that atomic bombs were only a few weeks away, it is possible that the institution would have been greatly strengthened. It must be strengthened now—strengthened and implemented with imagination and daring.

ON Aug. 6, 1945, a mighty revolution occurred in human society; and we must be no less revolutionary if we are to cope with it—revolutionary in our thinking and in our capacity for political and social adaptation.

One determined purpose must govern the development of the United Nations Organization in all stages of its evolution: never to water it down, never to weaken its authority, always to build it up, always to add to its prestige and moral power until the time comes when it speaks for the (Continued on Page 35)

One World Or None

(Continued from Page 35)

drama. With intelligence and conscience to guide us we can also make gigantic strides in social control, bringing our destructive weapons within the orbit of a world authority, and harnessing their powers to enhance the happiness of men and increase the dignity and worth of the human person.

THIS is not an idle dream. Its realization is distinctly possible, but only on the condition that we fight for it—fight for it with undisciplined faith and grim tenacity. If men everywhere realize the unprecedented peril in which they now stand, if they can develop the wisdom to use their technology only for constructive ends, if they will act on the principle that racial intolerance of every kind threatens the safety of the future, if they will move out into a new world society with decisiveness and daring, then the twentieth century can be redeemed and, as Thomas Paine said, we can begin the world over again.

But the time is short for all this. Man changes slowly, and his faltering steps toward adaptation have often been mired by his own inertia and prejudice. But now we must move quickly. We are summoned to accomplish in perhaps two or three decades, or even less, what we have failed to do in all the long history of the race. Urgency presses on our heels. The brotherhood to which our philosophy and religion have borne witness for so many centuries has suddenly become a condition of survival. If Mr. Willkie were writing his book today he would undoubtedly give it the title: "One World or None." And, since Aug. 6, 1945, that word "none" rings with an ominous sound.

NY Times
RIDAY, SEPTEMBER 7, 1945

WORLD UNIT URGED FOR ATOM CONTROL

League of Nations Union Asks
United Nations Organization
to Set Up Special Agency

By Wireless to THE NEW YORK TIMES.

LONDON, Sept. 6—A resolution calling upon the United Nations Organization to establish an agency to control atomic energy was adopted here today at a meeting of the General Council of the once-powerful League of Nations Union. Because of its important and distinguished leadership, this organization, which is considering transforming itself to conform to the new world set-up, still commands much respect in Britain.

Its conference was held on the eve of the resumption of the meetings of the executive committee of the United Nations Organization at which Edward R. Stettinius Jr. will take his place for the first time as chief of the United States delegations.

The resolution that the council of the League of Nations Union adopted read:

"Recognizing that the discovery of the release of atomic energy has created a deadly peril for world civilization; believing that any attempt to ward off the danger by secrecy will be neither desirable nor effective; hoping that by international action some means may be found to prevent the use of such weapons as the atomic bomb; the General Council of the League of Nations Union is nevertheless convinced that protection from the catastrophe with which we are threatened can only be achieved by abolition of war and that for that purpose the closest political and economic cooperation between the states has become necessary.

"The General Council further believes that United Nations should set up an appropriate international agency for the development of atomic energy in the interests of mankind."

He Hopes to Cure Bomb Victims

A Tokyo radio broadcast last night said that Dr. Masao Tsuzuki, a professor at the Tokyo Imperial University and Japan's leading authority on anatomy and pathology, was confident as the result of extensive studies that a majority of moderately injured victims of the atomic bomb could be cured, The Associated Press reported.

Dr. Tsuzuki has divided the effect of the atomic bomb on humans and animals into four categories: burns caused by light and heat waves, mechanical injury through explosion and concussion, injury resulting from some strong force, as yet unknown even to scientists, and the harmful effects of the pitch-black smoke following the explosion.

N. York Times 9/11
THE comics used to have a safe lead of twenty years over science, but the events of the past few weeks have

pressed the comics hard and changed the appearance of the field. Science has swung into the rail position; the tired comics feel the hot whip on their flanks. Even the nomenclature suggests a shift in the race. The latest element to turn up is called plutonium—which is Disney with a touch of mineral water. The word uranium had a mighty sound, a solemn sound, an awful sound. Plutonium is a belly laugh. Plutonium, incidentally, is not known in the stars; the stars are too high-minded. Plutonium is a mouthwash used by Mandrake. Plutonium is just something belonging



to the comical race of people who started their first atomic fire under a football stadium.

THE atomic age is scarcely a month old, yet we feel as though we've been swimming in its dark, radioactive waters for centuries. We recall old times with difficulty. One thing we do remember clearly, however: on the night of August 6th, before the atom took complete charge, there was a brief, suspended moment whose unfamiliar sweetness we savored with a satisfaction untroubled by the foreknowledge of doom. For a few hours on that summer night, several million American



boys and girls of around sixteen suddenly rose to undreamed-of heights in their own households as they deftly took the conversation away from their fumbling parents and from the radio and, in lucid,

painstaking, and curiously simple language, interpreted the atom to their elders. The necessary introductions, which were performed courteously and with hardly any patronizing, could have been made by no more competent authorities. Although it seemed as if it would shortly be followed by the end of the world, the evening was indisputably a triumph.

IT will be found, eventually, that just as impurities in water become radioactive from transmuted uranium, impurities in thought become radioactive from transmuted facts and figures lurking in the pitchblende of the mind. We have long suspected that impurities in thought become radioactive. It is a major problem. Fascism, one of the commonest impurities in human thought, is unquestionably radioactive.

Atomic Prophecy, 1931

That year two famous scientists forecast the development and use of atomic energy.

SUCCESSFUL development of the use of atomic power, though for more constructive purposes than atomic bombing, was predicted fourteen years ago by outstanding scientists, whose forecasts were published in the eightieth anniversary edition of THE NEW YORK TIMES, on Sept. 13, 1931.

Eight leaders in the field of science, government and industry were asked to envision the world of 2011, eighty years hence. Prof. Arthur H. Compton, Nobel Prize winner, and Dr. Michael Pupin, distinguished for his work in electrical communications, both predicted the discovery of the secret of atomic power and of the means to harness it for beneficial use by man. Here are excerpts from the prognostications of the eight men:

Prof. A. H. COMPTON—
 "During the next eighty years we may confidently expect power to become cheaper and more widely distributed and motors and fuel less bulky. Possibly this may mean the development of atomic power. We should at least know by that time whether we may look toward atomic destruction as a source of power that man may use.

"Following this power development, transportation should become faster and cheaper and communication by printed and spoken word and television much more common than at present, so that the whole earth will be one great neighborhood. With better communication, national boundaries will gradually cease to have their present importance. Because of racial differences, a world union cannot be expected within eighty years. The best adjustment that we can hope for to this certain change would seem to be the voluntary union of neighboring nations under a centralized government of continental size."

Dr. MICHAEL I. PUPIN—
 "Electron physics * * * has revealed a new view of the universe. According to this view, the universe is a vast electrical structure, having no other mass than the electrical energy of the electrons and protons, the components of its atoms and molecules. Electricity, therefore, is the fundamental substance of the universe; electrical energy is its fundamental energy; the diffusion of this energy through the interstellar space by the radiation of the blazing stars is its fundamental process.

"These new concepts, created by electron physics, have already produced a coalescence of physics and chemistry into one science. I venture to suggest that in another eighty years it will produce a similar coalescence between all natural sciences."

Dr. WILLIAM J. MAYO—
 "Fear concerning diminishing food supply, overpopulation and racial prejudice may lead peoples to aggression. Preparedness to protect our particular civilization and insure peace is a sacred obli-

gation to those who have gone before and those who are to follow. * * * Contagious and infectious diseases have been largely overcome and the average length of life of man has increased to fifty-eight years. * * * The progress that is being made would suggest that within the measure of time for this forecast the average lifetime of civilized man would be raised to the biblical term of threescore and ten."

HENRY FORD—"Perhaps our most progressive step will be the discovery that we have not made so much progress as the clatter of the times would suggest. Certainly there is today a wider and more intelligent recognition of the shortcomings of our civilization than at any previous period in this country, and that is a big step toward something better. * * * We shall go over our economic machine and redesign it, not for the purpose of making something different than what we have but to make the present machine do what we have said it could do."

Dr. ROBERT A. MILLIKAN—
 "Among the natural sciences it is rather in the field of biology than in physics that I myself look for the big changes in the coming century. Also the spread of the scientific method, which has been so profoundly significant for physics, to the solution of our social problems is almost certain to come."

Dr. WILLIAM F. OGBURN—
 "Inevitable technological progress and abundant natural resources will yield a higher standard of living. Poverty will be eliminated and hunger as a driving force of revolution will not be a danger. Inequality of income and problems of social justice will remain. Crises of life will be met by insurance."

SIR ARTHUR KEITH—"Eighty years ago medicine was divided among three orders of specialists—physicians, surgeons and midwives. Now there are more than fifty distinct special branches for the treatment of human ailments. It is this aspect of life—its ever-growing specialization—which frightens me. * * * I hope that eighty years hence family life will still prevail and that there will be liberty and opportunity for every individual to develop the gifts which nature has bestowed on him or her."

Dr. WILLIS R. WHITNEY—
 "There exist two widely divergent paths by which mankind has advanced. One is Bacon's 'variation in the efficient'—doing better in some ways what has already been done. It has become familiar to man in economics, in work of general welfare, in the mere mechanics of time-saving. The other path, extending beyond specific conceptions, leads to random and bold experiment—to pure research, where discovery is often unexpected. The most remarkable discoveries of the next eighty years will be of that kind."

Courage to Gamble By Eleanor Roosevelt

HYDE PARK, Sunday—I wonder if anyone noticed a little editorial item in one of the papers, not long ago, praising a former President of the United States for having the courage to allot two billion dollars to our scientists for the research which produced the atomic bomb. What ridicule this President would have had to face had the research been unsuccessful! Super-boondoggling would have been the least of the accusations leveled against him, stated the article. And so he was praised for being willing to gamble with the taxpayers' money, since there was the possibility of failure!

It struck me, as I read the item, that some people have very little conception of the responsibilities that any President of the United States, or any head of a government, must assume. In this particular case, it seems to me, the decision was an inevitable one, since it was well known that a race was on with Germany for this new discovery. If we had not taken the gamble of discovery, we would have taken the greater gamble of destruction in the event that Germany won in the race.

What struck me especially is that the courage to gamble with money should come as such a sur-

prise when so many greater gambles must be faced constantly. The man at the head of a great nation has to accept final responsibility. He takes the advice of scientists in a scientific project, and he gets the best advice he can. Every time some new move in a war is mapped out, it involves not only the expenditure of money but the expenditure of human lives. Here, again, the head of the government takes the best advice that he can get from his military advisers. Nevertheless, for good or ill, the ultimate decision and responsibility, when that military plan is made, remain with him.

Do you think any President or any head of a government—like Mr. Churchill, for instance—thought more seriously about the gamble of two billion dollars on a scientific experiment than he did about the gamble of the human lives involved in landing in Africa or on D-Day in Europe?

Too few of us ever think about the responsibility which rests in times of crises on the shoulders of the men who are heads of states. It is gracious to acknowledge the courage of a man when you recognize it. But in the present case the very acknowledgment showed how little we really understand the great responsibilities and more important decisions which required greater courage almost daily.

N.Y.T. 9/2

Dr. Bush Sees a Boundless Future for Science

WASHINGTON.

HIROSHIMA and Nagasaki are a long way from Washington, yet thought waves sent from Fifteenth and P streets in the capital built themselves into the mighty explosions which rocked the world.

It was uncanny to sit recently in the large, dark-paneled room in which five years ago plans were laid for the development of the atomic bomb. There around a long table a dozen scientists and military men discussed the splitting of the atom and the inauguration of a new form of warfare. As they talked about the destruction that this latent but still unharnessed force might bring about, Andrew Carnegie, the little Scotsman who gave away a fortune to promote peace, looked down from his frame on the wall.

At the head of the table sat a man who in appearance gave little impression of being vitally concerned with the smoke and din of battle. Tall, gaunt and angular, with a humorous twinkle in his small blue eyes and an obstinate lock of coarse, straight hair shooting forward from his slightly bulging forehead, he would have seemed more in place at a teacher's desk in a country school; his leisurely manner, his pithy speech, bespoke the classroom rather than the battlefield. Yet as Director of the Office of Scientific Research and Development it was he who laid the plans and assigned the investigations which led to the epochal bombing and thus played an important part in bringing the war to a close.

When the other day I saw Dr. Vannevar Bush in that room the silence which greeted my questions concerning the new weapon of war was in sharp contrast with the mighty roar which echoed through the New Mexico desert where he had nervously waited to see if the hitherto untried experiment would be successful.

Yet the silence which he preserved was as eloquent as the tiny wrinkles which shot upward from the corners of his eyes and mouth. They told in themselves of the satisfaction that he must have felt when the earth trembled and a tower of colored smoke rose 40,000 feet in the air. For then he knew the dream of the scientists had become a reality, the expenditures, no greater than the cost of one week of war, were justified, and peace was in sight.

IN a letter to Dr. Bush last November, President Roosevelt had pointed out that the Office of Scientific Research and Development represented a "unique experiment of team-work and cooperation in coordinating scientific research and in applying existing scientific research to the technical problems of war." "There is no reason," the letter said, "why the lessons found in this experiment cannot be profitably employed in times of peace."

"The results obtained by the Office of Scientific Research and Development in conjunction with the other committees working with it," said Dr. Bush, "show the value of team-work carried on under governmental supervision. Men of science throughout the country gladly laid aside their peacetime pursuits and gave themselves wholeheartedly to the work they were called upon to do. There was little chance for them to gain anything. Anonymity cloaked their efforts and much that was accomplished was of necessity secret.

"Now that the war is over the demand for their services is not so urgent. Nevertheless, science, properly directed, will

The OSRD director holds that we have the knowledge to build a new and better world.

By S. J. WOOLF



Drawing from life by S. J. Woolf.

"All scientific progress results from the free play of free intellects."

build a new and better world on the foundations which they have laid. It is a world which holds great promise for the common man. It is a world which gives a hope of peace through the fear inspired by its new weapons. A world in which the health of the people will be better and their span of life longer. There will be more jobs at better wages. The standard of living will be raised, there will be more leisure for recreation and study and the deadening drudgery which has been the burden of many will be lightened."

Dr. Bush is loath to make predictions. The changes that have occurred in the last five years and the rapid development of so many new ideas have been so startling that he hesitates to say what may happen. However, as he raised the curtain ever so slightly on the world of

the future, by implication as much as by words, he pictured a place in which the machine, driven eventually perhaps by a new power, plays an ever-increasing part.

The vision of Wells and Verne become almost commonplace in an era when planes darting through the skies annihilate distance by their increased speed, when the luxury liners of today will be almost as out of date as Fulton's Clermont, when the human senses will be still reinforced by electronic tubes and circuits. Chemistry will create new products, homes will be built on new plans and housework become a matter of pushing buttons. Automatic controls will regulate our machinery, and man will talk with whom he will as he drives in his lighter, speedier car.

"When this war began," Dr. Bush said, "there were millions of workers in

industries which were little dreamed of a quarter of a century ago. Radio, air-conditioning, plastics, rayon and nylon are but a few of the new products. This war has developed others which will find their way into use.

"The strides made in medicine certainly justify great hopes. During the last war fourteen men out of every thousand in the Army died from disease. During this war the mortality was one in 2,000. Penicillin and sulfa drugs, better vaccines, the new insecticide and improvements in hygienic measures have all but conquered many diseases which once killed thousands. We have discovered a control for malaria. The progress in surgery has been dramatic. New methods have been employed in the treatment of mental diseases.

CARRIED over into peacetime, these developments and discoveries point the way to a healthier era. They are but a beginning. We are still far from our goal. Even now the deaths from two diseases exceed the American lives lost in battle during the war. But the new world holds a definite promise for the mastering of these baffling menaces to life.

"When one compares the flying crates of the last war with the swift planes of today and realizes how young the airplane is, its future cannot be predicted. Greater speed and greater safety together with more comfort are certainties. There will be corresponding improvements in our surface travel and our methods of communication.

"The possibilities of science in the world of tomorrow are boundless. I have not said a word about the advances that have been made in agriculture in our scientific laboratories, nor have I spoken about the part that science must play in our national security.

"Although we look forward to peace, we must continue our preparedness along technical lines. It was science that conquered the U-boat and the V-1 bombs. The eyes of radar helped us win the war, but science brought forth a method of blinding those eyes."

Convinced that scientific progress is essential for our national welfare, Dr. Bush thinks that the Government must foster its development. He does not believe that this can be left to industry, for industry is concerned of necessity with the practical application of pure science rather than in opening up new frontiers.

ACCORDINGLY, and as a result of studies undertaken by different committees, he suggests the establishment of a national research foundation which would aid financially colleges, universities and research institutes where the quest for basic scientific knowledge is carried on. The foundation would institute long-range programs of research, create scholarships and fellowships to afford opportunities for scientific-minded young men and women, increase the compensation of scientists in Government laboratories and encourage private research in industry by allowing deductions from taxes for such work.

Moreover it would foster the flow of information and remove the secrecy, as far as is consistent with public welfare, from what is being accomplished. But above all else it would permit freedom of inquiry. "For," he says, "all scientific progress results from the free play of free intellects working on subjects of their own choice in (Continued on Page 46)

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Science Looks Ahead

(Continued from Page 14)

their own way." Carrying on "in his own way" has been characteristic of Dr. Bush all his life. Born fifty-three years ago in Everett, Mass., he often as a boy pumped the organ in the church of which his father was pastor. But as he did this he wondered why electricity was not used instead of hand power. Despite this interest in what was then a comparatively newly harnessed force, he had no clear idea of what he wanted to do in life. He had not made up his mind when he was graduated from Tufts College. The only thing of which he was sure was that he would have nothing to do with radio or electricity.

BUT he had to make his own living, so he took a job as an instructor in mathematics. Continuing his studies at the Massachusetts Institute of Technology, it was not long before he was made an assistant Professor of Electrical Engineering in that institution, and eventually he became its president.

He was holding that position when he was appointed chairman of the National Defense Research Committee and when this committee was absorbed by the Office of Scientific Research and Development he was made director of the newly formed body.

He has devised half a hundred contraptions which range from vacuum tubes to four-engined bombers. Recently a patent was granted him on a typewriter which makes the right hand margin of the page as regular as the left. Were he to wear all the medals that have been awarded to him he would look like a Christmas tree.

But neither his teaching nor his scientific pursuits prevented him from indulging in hobbies. When I saw him last year he was worried, despite the stress of his duties, because the thermostat in his aquarium had gone bad and he feared that his tropical fish could not withstand the chill. He is interested in color photography and for a time was a pool fiend. He never became an expert, because he was more concerned with the velocity of the balls than getting them in the pockets. He has also dabbled in painting, employing a method of his own. He puts transparent color on ground glass behind which is a light and in this way obtains remarkable effects.

LIKE many men of science there is something of the dreamer and poet in him. With pride he gave me a short piece he recently wrote, in which in simple but eloquent words he compares the structure of organized science with the "exploitation of a difficult quarry for its building materials and the fitting of these into an edifice." Then in metaphor and simile he describes the work of scientists, who are "The Builders."

When I asked him what he con-

sidered the principal problem of scientists, he said:

"The most important problem that faces science today is to bring up to date our methods of transmitting and reviewing the mass of research which has accumulated through the years. We have so much knowledge that we are engulfed in a sea of publications in which we flounder. In the age of airplanes we must plow through this in square-rigged ships. We have not employed the inventions that we have to make this easier.

WITH improvements, which will not take long to achieve, it will be possible to reduce the encyclopedia to the size of a match box and a library of a million volumes could be put on rolls of films that would take up comparatively no space. Moreover, the cost will be negligible.

"But it is not only in reproducing books that we have not advanced. By the development of devices already in use it will be possible to set down in print words as they are spoken. I can picture the scientist of the future with a tiny box strapped on his forehead photographing his experiments as they progress. And he will need no pencil or notebook, because his observations will be recorded in print as he utters them.

"We already have some machines that solve complicated equations and mathematical problems. With these as a beginning it is possible that other machines can be devised that will manipulate premises according to formal logic and we shall be able to turn a lever and punch out conclusions.

"The man of the future will sit at a desk on which are translucent screens, a keyboard, push buttons and levers. Within it will be rolls of microfilm on which are books and records as well as the mechanism for working it. There will be also unexposed film for him to jot down his notes. All of this film is so small that were he to write 5,000 pages a day it would take him a hundred years to fill the storage space.

IF the user wishes a certain book he finds out which key to strike through a code film, pushes it and it appears projected on the screen. He can read through the entire volume, stop it where he wants or turn to a particular page by means of the buttons on the desk. Instead of the old form of indexing there will be an improved system and selection by association, as the mind works, may eventually be mechanized.

"And," he went on, "all of this is but a development of present-day mechanisms and gadgets. The Rodin of the future who is inspired to make a statue of 'The Thinker,' may find that his models will be cogwheels, thermionic tubes and strands of wire."

Japanese Research Dropped in War With Big Laboratory Making Wine

Atom Energy Studies Abandoned for Lack of Materials and Funds—Only \$20,000 Set Aside Yearly for Project

By GEORGE E. JONES

By Wireless to THE NEW YORK TIMES.

TOKYO, Sept. 7—Japanese science and research fell into a state of inertia and neglect when the military took over the Government. By the war's end virtually nothing remained of independent scientific investigation.

A visit today to the Institute of Physical and Chemical Research here revealed that of the 118 buildings once used by chemists and physicists in Japan only thirty are in use. Once 2,000 persons worked at the institute, the largest of its kind in Japan. Now only 600 are employed there and their main daily task is the production of sake from dried sweet potatoes, an enterprise that the Japanese Government dictated when rice was no longer available for this purpose. A small amount of vitamin pills also were produced but the laboratories as such have disappeared.

Atomic Research Dropped

Neither the Government nor the Army encouraged atomic research, apparently believing Japanese science incapable of working out a formula for harnessing atomic energy.

"We never heard of the atomic bomb until your President announced it," said S. K. Hoshino, an institute director. "We did not get any place with our experiments."

Fallen into dusty disuse are two cyclotrons, one of which broke down completely and the other of which functioned only on a limited basis in breaking down certain types of atoms. This equipment had been installed seven years ago and had been used until six months ago for the instruction of students.

Before the war Japanese scientists had requested permission to view the University of California's equipment but they were turned down, Mr. Hoshino said, and experiments here never progressed beyond the elementary stages, which are familiar to any college physics student in the United States.

Behind this scientific atrophy lies the story of a military bureaucracy that suppressed free thought and imposed many limited objectives on the research laboratories.

Mr. Hoshino, who studied in London and later worked on a Japanese newspaper in New York for ten years, said that the military here never would have cooperated to the extent that the United States Government did in spending billions of dollars in atomic-bomb development. The Japanese Government, he said, gave the institute only 250,000 yen [equivalent at the present exchange rates to less than \$20,000 annually].

In return the institute and other scientific establishments in Japan were put to work experimenting on the production of synthetic gasoline, food concentrates and medicines. Yet the physicists and chemists themselves had no voice in the direction of research and many top-flight research men were taken into the Army and Navy.

Simultaneously a number of students declined to enter this field and those who did lacked adequate equipment and, in some cases, scholastic preparation.

Some efforts were made to improve upon American military weapons but so far as Mr. Hoshino knows these efforts came to naught. He said that there had been no substantial improvement made on an American built radar that had been captured at Manila early in the war and that had been long since outmoded by American improvements. "All we could do was to imitate," he said.

Even now, he said, there has been no preparation by Japanese scientists for the post-war requirements such as new industries, soil improvements and public health. Investigations for the purpose of

peacetime needs must be started anew, he said.

Acutely aware of their shortcomings and handicaps as the Japanese scientists are, their perception is fully equalled by almost any Japanese with whom one can talk. Hardly a conversation passes without a statement to the effect that "you beat us because of superior science."

The atomic bomb epitomized for most Japanese this superiority, and the destruction in Hiroshima and Nagasaki brought home to the layman what the better-educated Japanese knew all along—that Japanese science was inadequate on its own to compete with the free thought and investigation of Western science, and that Japanese resources in trained men, material and money were too limited.

This recognition of scientific inferiority already had led to repeated expressions of hope that soon Japanese scientists could resume friendly relations with American and British laboratories—avowedly, of course, for peaceful purposes.

Yet an editorial in the Mainichi, a large Tokyo daily, entitled "Possibilities of an Unarmed Great Power," said:

"According to the notions held heretofore no great power could exist that was not a strong power. Yet * * * can we not succeed to build up for the first time in the history of mankind a great power without arms?"

"It is said that on account [of the atomic bomb] future wars will entirely change * * *. Inevitably the theory and production method of the atomic bomb will have to be made public before long. At any rate the wars hereafter will have to be fought with weapons entirely different and by entirely new methods."

New Science Board Set Up

The Japanese Ministry of Education, with the aim of "building a nation of science," has taken over all the administrative offices relating to scientific research in the Board of Technology and has created a Bureau of Scientific Education, the "most important bureau in the Ministry," Domei, the Japanese news agency, said yesterday.

In a wireless dispatch beamed to Asia and recorded by the Federal Communications Commission, Domei said that a science research council, to be organized with "learned persons from the entire nation, will cast aside all scientific studies which heretofore have been devoted solely to war."

"To mobilize the knowledge of learned persons for the purpose of building a new scientific Japan," the council will place emphasis on the study of basic sciences, the dispatch said.

In addition, an "international division will be set up within the council to study the essence of the scientific studies of other countries and to promote the advancement toward a scientific civilization," Domei added.

HEAT TO BE PRODUCT OF ATOMIC ENERGY

General Electric Experts Think This the Most Probable Use of New Power

NYT 8/4
SCHENECTADY, N. Y., Sept. 3—The most probable use of nuclear energy, the basis for the atomic bomb, is as a source of heat, two experts of the General Electric Company said today in answer to questions received from industry and the general public about the potentialities of atomic power.

Concerning the possible use of nuclear energy as a source of power to heat and light homes and buildings, operate factories, propel ships, locomotives, airplanes and automobiles, Harry A. Winne, vice president in charge of engineering policy, and Dr. C. Guy Suits, vice president and director of the research laboratory, predicted that several uses of nuclear energy would become technically possible, but that it was too early to predict whether such uses would be economically practical.

In stating that the most probable use of nuclear energy was as a source of heat, the officials said that such heat in turn might produce steam or hot gases for use in conventional types of power-generating equipment.

"Some people have asked concerning the possibility of direct conversion from nuclear energy to electric power in usable form. This seems to us an extremely remote possibility," said Mr. Winne and Dr. Suits. "There is a long road of development ahead.

"It is true that the success of the bomb demonstrated that we can release a tremendous amount of nuclear energy in one instantaneous blast, at a controlled time. But to make this form of energy commercially useful we must learn how to generate it and control it in a

way that is adaptable to power production. We have no doubt that we shall learn how to do this, but the learning will take a lot of research, development and time."

Concerning the dangers to human life which result from the radiation accompanying nuclear energy, they said:

"Obviously, if we should have to

encase a nuclear power plant in many feet of lead or concrete it would lose some of its attractiveness. Here also we believe we shall find a practical solution to the problem, but this will take time."

Most difficult to answer is the question of the economic practicability of commercial use of nuclear

energy. The \$2,000,000,000 cost of the atomic bomb program unquestionably could be reduced greatly if a similar project were to be started today, based on the knowledge gained through this development, but it would still be a tremendously costly undertaking.

To central power stations, railroads or other businesses in which

the generation or use of power is of extreme importance, the engineering and research chiefs gave this advice:

"Were we responsible for conducting the affairs of such organizations, we should go right ahead with our plans for the years to come on the basis of present-day available sources of energy, namely, coal, oil and water power. Only as research and development proceed shall we learn the limitations and possible practical commercial applications of nuclear power."

Many scientists and engineers were assigned by General Electric to the atomic bomb project. Mr. Winne supervised the development and production of apparatus manufactured in virtually every General Electric factory for the Government plants which produced the bomb. Dr. Suits directed research activities on the project. As early as 1940 Dr. K. H. Kingdon and Dr. H. C. Pollock of the research laboratory staff were among the first to isolate uranium 235, used in nuclear energy research and in the manufacture of the atomic bomb.

CONNALLY WANTS U. S. TO KEEP BOMB

Would Provide Special Force for Security Council—Mead Proposes Outlawing It

WASHINGTON, Sept. 8 (AP)—Sen. Tom Connally, chairman of the Senate Foreign Relations Committee, proposed today that the United States furnish a flying task force of atomic bombers to the United Nations Security Council but retain the secret of their awful power.

His suggestion was the second definite plan put forward during the day for control of the new explosive force. Sen. James M. Mead, Democrat, of New York, proposed an international agreement to outlaw the use of atomic bombs in war.

"The secret of the atomic bomb ought to be retained by the United States," Senator Connally flatly told an interviewer.

The Texas Democrat added: "We shall never use it, except in the interest of world peace or our own necessary self-defense.

"The United States is a member of the Security Council and will furnish a contingent of air forces.

Would Keep Secrets in U. S.

"Armed with a few atomic bombs such a force conceivably could crush any attack or act of aggression quickly and effectively."

Mr. Connally declared that in addition to keeping the secrets of atomic fission for this nation, we should tie up "all available sources of uranium and other elements necessary to the manufacture of the atomic bomb." He said that he had not been impressed by the theories that civilization might not be able to survive the atomic bomb.

"Civilization has survived floods and storm, the Black Death, the plague, barbaric massacres and bloody wars," he said.

He added that the history of warfare showed that for every offensive weapon an adequate defense had been contrived.

Senator Mead told a reporter that he believed that a world scared by the explosive power of nuclear energy would think twice before it violated an anti-atom bombing agreement and invited its own destruction.

As a precedent, the chairman of the Senate's War Investigating Committee pointed out that battling nations generally lived up to their pledge not to use poison gas in World War II.

But Senator Richard B. Russell, Democrat, of Georgia, did not think that parallel would hold.

"The Axis would have used poison gas if Germany and Italy had not been so vulnerable to it themselves," he declared. "I would be glad if an international agreement could be reached not to use the atomic bomb in war. But I don't think you can ever trust an aggressor."

Russell Supports Connally

Senator Russell agreed with Senator Connally that the United States should not share the secret. "We might make available to the World Security Council a certain number of bombs if it has to use force to keep the peace," he said.

"But I think we ought to keep the technical know-how to ourselves as long as possible."

President Truman has said that he intended to give Congress later his ideas on what to do about the bomb, as well as the development of atomic energy for peacetime uses.

And Senate Republicans intend to demand that Congress have the final word on policy.

Chairman Robert A. Taft, Republican of Ohio, said that the minority Steering Committee had agreed on that point. But he admitted that none of the Senators had any definite ideas yet on what the policy might be.

The Republicans are backing a resolution by Senator Arthur H. Vandenberg, Republican, of Michigan, for a joint committee of six House and six Senate members to study the development and control of the bomb.

Senate, Commerce and Military Subcommittees, headed respectively by Senators Warren G. Magnuson, Democrat, of Washington, and Harley M. Kilgore, Democrat, of West Virginia, plan joint hearings about Oct. 1 on the whole field of scientific research.

But Senator Vandenberg thought the atomic bomb problem was too far reaching to be dealt with except by a joint, special committee.

SICKNESS AFTER VISIT TO HIROSHIMA DENIED

SAN FRANCISCO, Sept. 8 (UP)—A broadcast over the Tokyo radio today quoted a Japanese scientist as having said that all persons one kilometer or less from the atomic bomb explosion at Hiroshima Aug. 6 who had not been burned had suffered after-effects.

However, Uzuhiko Kurimoto, assistant professor of contagious disease research of the Tokyo Imperial University, said that he had discovered no evidence that trips to the bombed area after the explosion had resulted in sickness.

The broadcast, recorded by The United Press, said that Dr. Kurimoto and two other researchers had just left Hiroshima after having completed an eleven-day study of "the effects of the atomic bomb on human beings."

Dr. Kurimoto said that a study of about seventy cases had convinced him that while some persons further than two kilometers from the explosion had been burned, none "have shown signs of any sickness originating from the atomic bomb."

[From Late Edition of Yesterday's TIMES.]

Nagoya Plane Plant Wiped Out

NAGOYA, Japan, Sept. 7 (AP)—The largest air plant in the world is in complete ruin here. American bomb appraisal experts who inspected the wrecked plants here and in Kobe and Osaka pronounced the devastation complete. Nagoya's Mitsubishi aircraft works were recognized as the largest in the world in December, 1944, when they were producing 17 per cent of Japan's planes. They covered more than 5,000,000 square feet.

ATOMIC BOMBING OF NAGASAKI TOLD BY FLIGHT MEMBER

Seething Pillar of Fire Rose
60,000 Feet From Blast—
Planes High Up Rocked

ELECTRICAL STORM ON TRIP

Two Other B-29's Escorted
Strike Ship—Enemy Flak Met
Going In to the Target

Mr. Laurence, science writer for THE NEW YORK TIMES and a Pulitzer Prize winner, is a special consultant to the Manhattan Engineer District, the War Department's special service that developed the atomic bomb.

By WILLIAM L. LAURENCE
WITH THE ATOMIC BOMB MISSION TO JAPAN, Aug. 9 (Delayed)—We are on our way to bomb the mainland of Japan. Our flying contingent consists of three specially designed B-29 "Superforts," and two of these carry no bombs. But our lead plane is on its way with another atomic bomb, the second in three days, concentrating its active substance and explosive energy equivalent to 20,000 and, under favorable conditions, 40,000 tons of TNT.

We have several chosen targets. One of these is the great industrial and shipping center of Nagasaki, on the western shore of Kyushu, one of the main islands of the Japanese homeland.

I watched the assembly of this man-made meteor during the past two days, and was among the small group of scientists and Army and Navy representatives privileged to be present at the ritual of its loading in the "Superfort" last night, against a background of threatening black skies torn open at intervals by great lightning flashes.

It is a thing of beauty to behold this "gadget." In its design went millions of man-hours of what is without doubt the most concentrated intellectual effort in history. Never before had so much brain-power been focused on a single problem.

This atomic bomb is different from the bomb used three days ago with such devastating results on Hiroshima.

I saw the atomic substance before it was placed inside the bomb. By itself it is not at all dangerous to handle. It is only under certain conditions, produced in the bomb assembly, that it can be made to yield up its energy, and even then it gives only a small fraction of its total contents—a fraction, however, large enough to produce the greatest explosion on earth.

The briefing at midnight revealed the extreme care and the tremendous amount of preparation that had been made to take care of every detail of the mission, to make certain that the atomic bomb fully served the purpose for which it was intended. Each target in turn was shown in detailed maps and in aerial photographs. Every detail of the course was rehearsed—navigation, altitude, weather, where to land in emergencies. It came out that the Navy had submarines and rescue craft, known as Dumbos and Superdumbos, stationed at various strategic points in the vicinity of the targets, ready to rescue the fliers in case they were forced to bail out.

The briefing period ended with a moving prayer by the chaplain. We then proceeded to the mess hall for the traditional early morning breakfast before departure on a bombing mission.

A convoy of trucks took us to the supply building for the special equipment carried on combat missions. This included the "Mae West," a parachute, a life boat, an oxygen mask, a flak suit and a survival vest. We still had a few hours before take-off time, but we all went to the flying field and stood around in little groups or sat in jeeps talking rather casually about our mission to the empire, as the Japanese home islands are known hereabouts.

In command of our mission is Maj. Charles W. Sweeney, 25, of 124 Hamilton Avenue, North Quincy, Mass. His flagship, carrying the atomic bomb, is named The Great Artiste, but the name does not appear on the body of the great silver ship, with its unusually long, four-bladed, orange-tipped propellers. Instead it carried the number 77, and someone remarks that it was "Red" Grange's winning number on the gridiron.

Bombardier an 8th A. F. Veteran
Major Sweeney's co-pilot is First Lieut. Charles D. Albury, 24, of 252 Northwest Fourth Street, Miami, Fla. The bombardier, upon whose shoulders rests the responsibility of depositing the atomic bomb square on its target, is Capt. Kermit K. Beahan of 1004 Telephone Road, Houston, Tex., who is celebrating his twenty-seventh birthday today.

Captain Beahan has the award of the Distinguished Flying Cross, the Air Medal and one Silver Oak Leaf Cluster, the Purple Heart, the Western Hemisphere Ribbon, the European Theatre Ribbon and two battle stars. He participated in the first Eighth Air Force heavy bombardment mission against the Germans from England on Aug. 17, 1942, and was on the plane that transported Gen. Dwight D. Eisenhower from Gibraltar to Oran at the beginning of the North African invasion. He has had a number of hair-raising escapes in combat.

The navigator on the Great Artiste is Capt. James F. Van Pelt Jr., 27, of Oak Hill, W. Va. The flight engineer is M/Sgt. John D. Kuharek, 32, of 1054 Twenty-second Avenue, Columbus, Neb.; S/Sgt. Albert T. De Hart of Plainview, Tex., who celebrated his thirtieth birthday yesterday, is the tail gunner; the radar operator is S/Sgt. Edward K. Buckley, 32, of 529 East Washington Street, Lisbon, Ohio. The radio operator is Sgt. Abe M. Spitzer, 33, of 655 Pelham Parkway, North Bronx, N. Y.; Sgt. Raymond Gallagher, 23, of 572 South Mozart Street, Chicago, is assistant flight engineer.

The lead ship is also carrying a group of scientific personnel, headed by Comdr. Frederick L. Ashworth, USN, one of the leaders in the development of the bomb. The group includes Lieut. Jacob Beser, 24, of Baltimore, Md., an expert on airborne radar.

The other two Superfortresses in our formation are instrument planes, carrying special apparatus to measure the power of the bomb at the time of explosion, high speed cameras and other photographic equipment.

Our "Superfort" is the second in line. Its commander is Capt. Frederick C. Bock, 27, of 300 West Washington Street, Greenville, Mich. Its other officers are Second Lieut. Hugh C. Ferguson, 21, of 247 Windermere Avenue, Highland Park, Mich., pilot; Second Lieut. Leonard A. Godfrey, 24, of 72 Lincoln Street, Greenfield, Mass., navigator; and First Lieut. Charles Levy, 26, of 1954 Spencer Street, Philadelphia, bombardier.

The enlisted personnel of this "Superfort" are: T/Sgt. Roderick F. Arnold, 28, of 130 South Street, Rochester, Mich., flight engineer; Sgt. Ralph D. Curry, 20, of 1101 South Second Avenue, Hoopston, Ill., radio operator; Sgt. William C. Barney, 22, of Columbia City, Ind., radar operator; Corp. Robert J. Stock, 21, of 415 Downing Street, Fort Wayne, Ind., assistant flight engineer, and Corp. Ralph D. Belanger, 19, of Thendara, N. Y., tail gunner.

The scientific personnel of our "Superfort" includes S/Sgt. Walter Goodman, 22, of 1956 Seventy-fourth Street, Brooklyn, N. Y., and Lawrence Johnson, graduate student at the University of California, whose home is at Hollywood, Calif.

The third "Superfort" is commanded by Maj. James Hopkins, 1311 North Queen Street, Palestine, Tex. His officers are Second Lieut. John E. Cantlon, 516 North Takima Street, Tacoma, Wash., pilot; Second Lieut. Stanley C. Steinke, 604 West Chestnut Street, West Chester, Pa., navigator; and Second Lieut. Myron Faryna, 16 Elgin Street, Rochester, N. Y., bombardier.

The crew are Tech. Sgt. George L. Brabenc, 9717 South Lawndale Avenue, Evergreen, Ill.; Sgt. Francis X. Dolan, 30-60 Warrent Street, Elmhurst, N. Y.; Corp. Richard F. Cannon, 160 Carmel Road, Buffalo, N. Y.; Corp. Martin G. Murray, 7356 Dexter Street, Detroit, Mich., and Corp. Sidney J. Bellamy, 529 Johnston Avenue, Trenton, N. J.

On this "Superfort" are also two distinguished observers from Britain, whose scientists played an important role in the development of the atomic bomb. One of these is Group Capt. G. Leonard Cheshire, famous Royal Air Force pilot, who is now a member of the British military mission to the United States. The other is Dr. William G. Denny, Professor of Applied Mathematics, London University, one of the group of eminent British scientists that has been working at the "Y-Site" near Santa Fe, N. M., on the enormous problems involved in taming the atom.

Group Captain Cheshire, whose rank is the equivalent to that of colonel in the United States Army Air Forces, was designated as an observer of the atomic bomb in action by Winston Churchill when he was still Prime Minister. He is now the official representative of Prime Minister Clement R. Attlee.

In Storm Soon After Take-Off

We took off at 3:50 this morning and headed northwest on a straight line for the Empire. The night was cloudy and threatening, with only a few stars here and there breaking through the overcast. The weather report had predicted storms ahead part of the way but clear sailing for the final and climactic stages of our odyssey.

We were about an hour away from our base when the storm broke. Our great ship took some heavy dips through the abysmal darkness around us but it took these dips much more gracefully than a large commercial airliner, producing a sensation more in the nature of a glide than a "bump," like a great ocean liner riding the waves, except that in this case the air waves were much higher and the rhythmic tempo of the glide much faster.

I noticed a strange eerie light coming through the window high above the navigator's cabin and as I peered through the dark all around us I saw a startling phenomenon. The whirling giant propellers had somehow become great luminous discs of blue flame.

The same luminous blue flame appeared on the plexiglass windows in the nose of the ship, and on the tips of the giant wings it looked as though we were riding the whirlwind through space on a chariot of blue fire.

It was, I surmised, a surcharge of static electricity that had accumulated on the tips of the propellers and on the dielectric material in the plastic windows. One's thoughts dwelt anxiously on the precious cargo in the invisible ship ahead of us. Was there any likelihood of danger that this heavy electric tension in the atmosphere all about might set it off?

I expressed my fears to Captain Bock, who seems nonchalant and unperturbed at the controls. He quickly reassures me:

"It is a familiar phenomenon seen often on ships. I have seen it many times on bombing missions. It is known as St. Elmo's Fire."

On we went through the night. We soon rode out the storm and our ship was once again sailing on a smooth course straight ahead, on a direct line to the Empire.

Our altimeter showed that we were traveling at a height of 17,000 feet. The thermometer registered an outside temperature of 33 degrees below zero centigrade, about 30 below Fahrenheit. Inside our pressurized cabin the temperature was that of a comfortable air-conditioned room, and a pressure corresponding to an altitude of 8,000 feet. Captain Bock cautioned me, however, to keep my oxygen mask handy in case of emergency. This, he explained, might mean either something going wrong with the pressure equipment inside the ship or a hole through the cabin by flak.

The first signs of dawn came shortly after 5 o'clock. Sergeant Curry, who had been listening steadily on the earphones for radio reports while maintaining a strict radio silence himself, greeted it by rising to his feet and gazing out the window.

"It's good to see the day," he told me. "I get a feeling of claustrophobia hemmed in in this cabin at night."

He is a typical American youth,

looking even younger than his 20 years. It takes no mind reader to read his thoughts.

"It's a long way from Hopston, Ill.," I find myself remarking.

"Yep," he replies, as he busies himself decoding a message from outer space.

"Think this atomic bomb will end the war?" he asks hopefully.

"There is a very good chance that this one may do the trick," I assure him, "but if not then the next one or two surely will. Its power is such that no nation can stand up against it very long."

This was not my own view. I

had heard it expressed all around a few hours earlier before we took off. To anyone who had seen this man-made fireball in action, as I had less than a month ago in the desert of New Mexico, this view did not sound over-optimistic.

By 5:50 it was real light outside. We had lost our lead ship but Lieutenant Godfrey, our navigator, informs me that we had arranged for that contingency. We have an assembly point in the sky above the little island of Yakushima, southeast of Kyushu, at 9:10. We are to circle there and wait for the rest of our formation.

Our genial bombardier, Lieutenant Levy, comes over to invite me to take his front-row seat in the transparent nose of the ship and I accept eagerly. From that vantage point in space, 17,000 feet above the Pacific, one gets a view of hundreds of miles on all sides, horizontally and vertically. At that height the vast ocean below and the sky above seem to merge into one great sphere.

I was on the inside of that firmament, riding above the giant mountains of white cumulous clouds, letting myself be suspended in infinite space. One hears the whirl of the motors behind one, but it soon becomes insignificant against the immensity all around and it before long swallowed by it. There comes a point where space also swallows time, and one lives through eternal moments filled with an oppressive loneliness, as though all life had suddenly vanished from the earth and you are the only one left, a lone survivor traveling endlessly through interplanetary space.

My mind soon returns to the mission I am on. Somewhere beyond these vast mountains of white clouds ahead of me there lies Japan, the land of our enemy. In about four hours from now one of its cities, making weapons of war for use against us, will be wiped off the map by the greatest weapon ever made by man. In one-tenth of a millionth of a second, a fraction of time immeasurable by any clock, a whirlwind from the skies will pulverize thousands of its buildings and tens of thousands of its inhabitants.

Weather Planes Fly Ahead

Our weather planes ahead of us are on their way to find out where the wind blows. Half an hour before target time we will know what the winds have decided.

Does one feel any pity or compassion for the poor devils about to die? Not when one thinks of Pearl Harbor and of the Death March on Bataan.

Captain Bock informs me that we are about to start our climb to bombing altitude.

He manipulates a few knobs on his control panel to the right of him and I alternately watch the white clouds and ocean below me and the altimeter on the bombardier's panel. We reached our altitude at 9 o'clock. We were then over Japanese waters, close to their mainland. Lieutenant Godfrey motioned to me to look through his radar scope. Before me was the outline of our assembly point. We shall soon meet our lead ship and proceed to the final stage of our journey.

We reached Yakushima at 9:12 and there, about 4,000 feet ahead of us, was The Great Artiste with its precious load. I saw Lieutenant Godfrey and Sergeant Curry strap on their parachutes and I decided to do likewise.

We started circling. We saw little towns on the coastline, heedless of our presence. We kept on circling, waiting for the third ship in our formation.

It was 9:56 when we began heading for the coastline. Our weather scouts had sent us code messages, deciphered by Sergeant Curry, informing us that both the primary target as well as the secondary were clearly visible.

The winds of destiny seemed to favor certain Japanese cities that must remain nameless. We circled about them again and again and found no opening in the thick umbrella of clouds that covered them. Destiny chose Nagasaki as the ultimate target.

We had been circling for some time when we noticed black puffs

of smoke coming through the white clouds directly at us. There were fifteen bursts of flak in rapid succession, all too low. Captain Bock changed his course. There soon followed eight more bursts of flak, right up to our altitude, but by this time were too far to the left.

We flew southward down the channel and at 11:33 crossed the coastline and headed straight for Nagasaki about 100 miles to the west. Here again we circled until we found an opening in the clouds. It was 12:01 and the goal of our mission had arrived.

We heard the pre-arranged signal on our radio, put on our arc-welder's glasses and watched tensely the maneuverings of the strike ship about half a mile in front of us.

"There she goes!" someone said. Out of the belly of gust the Artiste what looked like a black object went downward.

Captain Bock swung around to get out of range; but even though we were turning away in the opposite direction, and despite the fact that it was broad daylight in our cabin, all of us became aware of a giant flash that broke through the dark barrier of our arc-welder's lenses and flooded our cabin with intense light.

Phone Trembles in the Blast

We removed our glasses after the first flash but the light still lingered on, a bluish-green light that illuminated the entire sky all around. A tremendous blast wave struck our ship and made it tremble from nose to tail. This was followed by four more blasts in rapid succession, each resounding like the boom of cannon fire hitting our plane from all directions.

Observers in the tail of our ship saw a giant ball of fire rise as though from the bowels of the earth, belching forth enormous white smoke rings. Next they saw a giant pillar of purple fire, 10,000 feet high, shooting skyward with enormous speed.

By the time our ship had made another turn in the direction of the atomic explosion the pillar of purple fire had reached the level of our altitude. Only about forty-five seconds had passed. Awe-struck, we watched it shoot upward like a meteor coming from the earth instead of from outer space, becoming ever more alive as it climbed skyward through the white clouds. It was no longer smoke, or dust, or even a cloud of fire. It was a living thing, a new species of being, born right before our incredulous eyes.

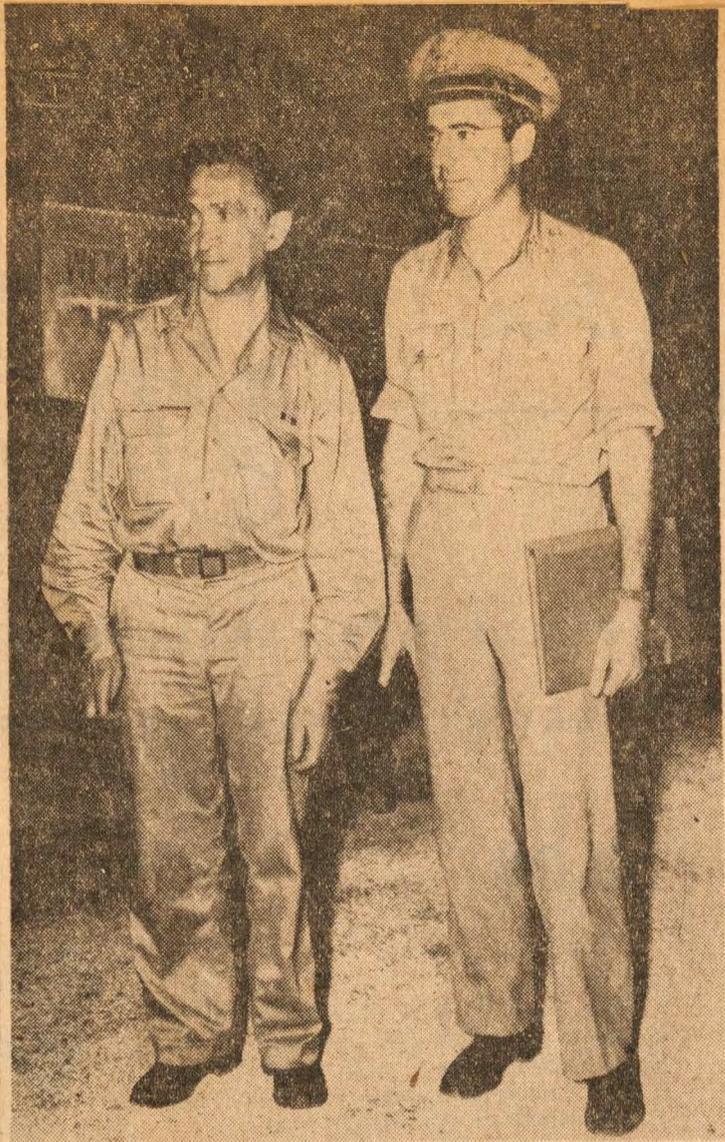
At one stage of its evolution, covering millions of years in terms of seconds, the entity assumed the form of a giant square totem pole, with its base about three miles long, tapering off to about a mile at the top. Its bottom was brown, its center was amber, its top white. But it was a living totem pole, carved with many grotesque masks grimacing at the earth.

Then, just when it appeared as though the thing has settled down into a state of permanence, there came shooting out of the top a giant mushroom that increased the height of the pillar to a total of 45,000 feet. The mushroom top was even more alive than the pillar, seething and boiling in a white fury of creamy foam, sizzling upward and then descending earthward, a thousand Old Faithful geysers rolled into one.

It kept struggling in an elemental fury, like a creature in the act of breaking the bonds that held it down. In a few seconds it had freed itself from its gigantic stem and floated upward with tremendous speed, its momentum carrying into the stratosphere to a height of about 60,000 feet.

But no sooner did this happen when another mushroom, smaller in size than the first one, began emerging out of the pillar. It was as though the decapitated monster was growing a new head.

As the first mushroom floated off into the blue it changed its shape into a flowerlike form, its giant petal curving downward, creamy white outside, rose-colored inside. It still retained that shape when we last gazed at it from a distance of about 200 miles.



William L. Laurence of The New York Times (left) and Maj. John F. Moynahan of West Orange, N. J., public relations officer, at an airfield in the Pacific before taking off on mission over Japan.

The New York Times (U. S. Army Air Forces)

Site of Atomic Bomb Test To Be National Monument

By The Associated Press.

WASHINGTON, Sept. 8—Secretary of the Interior Harold L. Ickes took steps today to create a new national monument at the site of the first test explosion of the atomic bomb in New Mexico.

The first atomic bomb was exploded on July 16 on public grazing lands withdrawn in 1942 for use by the War Department as a bombing range. The site became known as the Alamogorda Bombing Range.

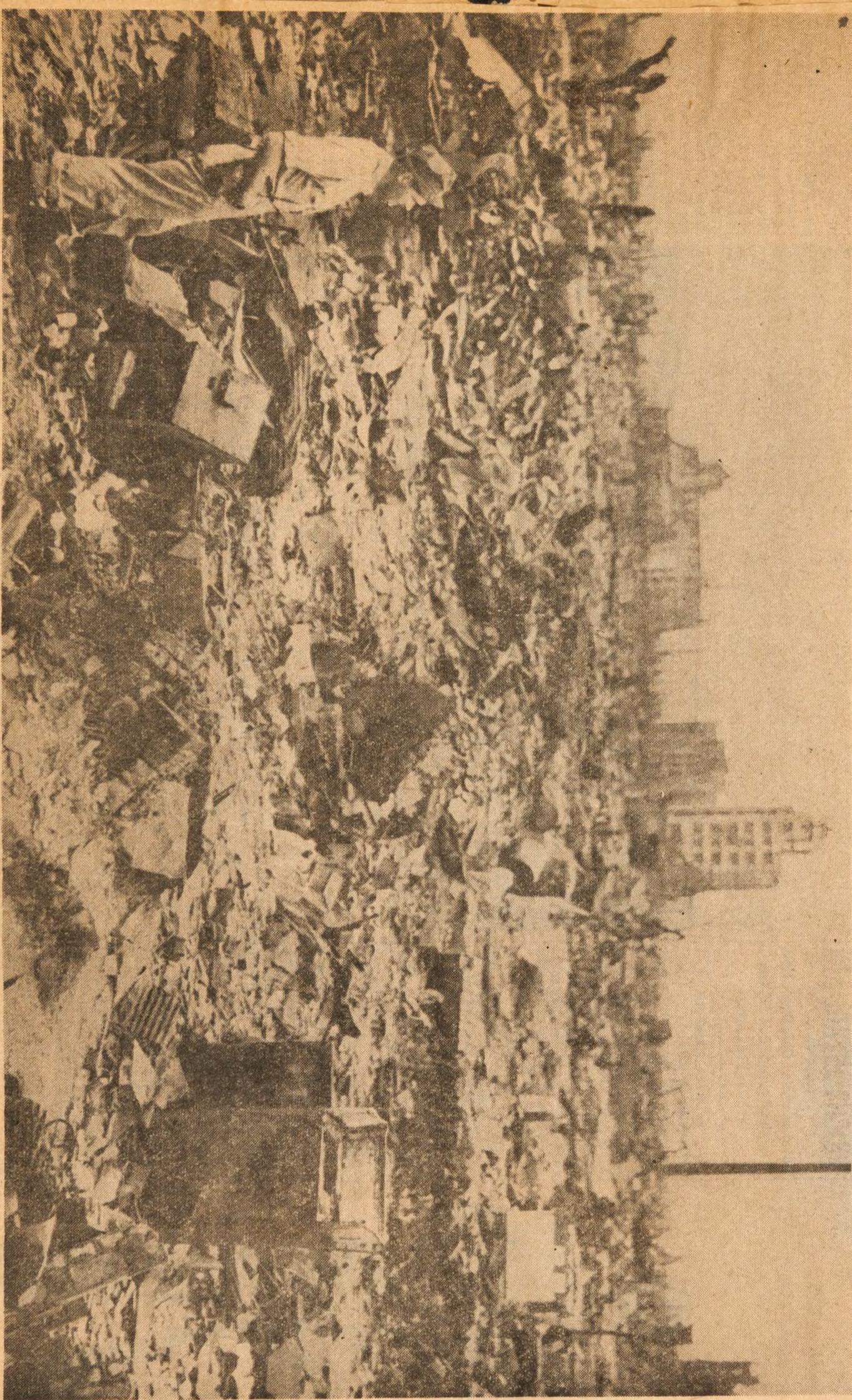
Mr. Ickes directed Fred W. Johnson, Commissioner of the General Land Office, to reserve the lands surrounding the place of the atomic bomb experiment for a new national monument. He said:

"The harnessing of the basic power of the universe through the atomic bomb ushers in a new era in man's understanding of nature's forces and presages the use of atomic power not only as a forceful influence toward the maintenance of world peace, but also as an instrument, through use in peace, for the creation of a better standard of living throughout the world.

"It is only fitting, therefore, that a national monument be established at the site of the first non-laboratory use of atomic power to commemorate that great historic and scientific event."

THE NEW YORK TIMES, SUNDAY, SEPTEMBER 9, 1945.

Aftermath of Atomic Bomb: A City Laid Waste by World's Most Destructive Force



An Allied correspondent looks over acres of rubble, all that remains of a section of Hiroshima after the first of the powerful missiles was dropped on the target.

Associated Press

HIROSHIMA TOLL 126,000

Domei Reports Figures Given by Prefectural Government

TOKYO, Sept. 8 (AP)—Domei, the Japanese news agency, said today that 126,000 persons had been killed at Hiroshima by the world's first atomic bombing.

This figure is more than twice as great as any previously reported by the Japanese.

Domei, quoting the Hiroshima Prefectural Government as authority for its report, listed casualties as follows: Instantly killed, 66,000; died of injuries, 60,000; Missing and believed dead, 10,000; seriously injured, 14,000; slightly injured, 104,000.

ATOMIC FORCE ITS MEANING FOR MANKIND

ANNOUNCER: *"This revelation of the secrets of nature, long mercifully withheld from man, should arouse the most solemn reflections in the mind and conscience of every human being capable of comprehension."*¹

The three participants in the discussion which follows represent the University of Chicago, which served as a principal center of fundamental research in the development of the atomic bomb. The University on August 10 announced the establishment of a comprehensive program for studying the peacetime uses of atomic force. To promote this study, the University has created two institutes—one for nuclear study and one for metal study. Among others, the University has announced the appointment of two Nobel Prize winners, Harold Urey and Enrico Fermi, to the faculty of the institutes.

MR. HUTCHINS: Gentlemen, is the atomic bomb good or bad for the world?

MR. GUSTAVSON: On the day that the first atomic bomb was dropped, I met the director of the University laboratory which helped to develop it. His first words to me were: "This is a very sad day for us. Let us hope that we've not placed dynamite in the hands of children."

MR. HUTCHINS: Was it wise to use this bomb against Japan?

MR. OGBURN: By ending the war, it saved more lives than were lost at Hiroshima.

MR. HUTCHINS: Was the war not going to end anyway?

MR. OGBURN: But when? The Japanese minister to Sweden has said that the

¹ This quotation is an excerpt from the statement on the atomic bomb by former Prime Minister Churchill. The text of this statement was released on August 6, 1945, by Prime Minister Attlee.

Around the Round Table



REUBEN G. GUSTAVSON was recently appointed Vice-President and Dean of the Faculties of the University of Chicago. He came to Chicago from the University of Colorado, where he had been serving as acting president. Mr. Gustavson studied at the University of Denver and received his M.A. and Ph.D. degrees at the University of Chicago. He was a member of the department of chemistry of the University of Denver from 1920 until 1937, when he became professor of chemistry and chairman of the department at the University of Colorado. In 1942 he was made dean of the graduate school and the next year acting president of the University of Colorado. He has been a contributor to the *Journal of the American Chemical Society* and the *Journal of the American Medical Association*.



ROBERT M. HUTCHINS, who has been the President of the University of Chicago since 1929, recently became Chancellor of the University. Before coming to the University of Chicago, he served as dean of the Yale Law School and lecturer and professor of law. Chancellor Hutchins attended Oberlin College and received his A.B., A.M., and LL.B. degrees at Yale University. Since 1943 he has been a director of the *Encyclopaedia Britannica*. He has written numerous magazine articles and is the author of *No Friendly Voice* (1936); *The Higher Learning in America* (1936); and *Education for Freedom* (1943).



WILLIAM F. OGBURN, Sewell L. Avery Distinguished Service Professor of Sociology at the University of Chicago, did his undergraduate study at Mercer University and received his A.M. and Ph.D. degrees from Columbia University. Before coming to the University of Chicago in 1933, Professor Ogburn taught at Princeton University, the University of Washington, and Columbia University. He has been active in national affairs and served as director of research for the President's Research Committee on Social Trends. He also served on the Consumers Advisory Committee, the N.R.A., the Resettlement Administration, and on the science commission of the National Resources Planning Board. He was the editor of *Recent Social Changes* (1933) and *Technological Trend and National Policy* (1937). He is the author of many books, among which are: *Progress and Uniformity in Child Labor Legislation* (1912); *Social Change* (1922); *The Social Sciences* (1927); *Economic Development of Post War France* (1929); *You and Machines* (1935); and *Social Characteristics of Cities* (1937); and is co-author of *Sociology* (1940).

atomic bomb brought the plea for peace. We cannot have peace or progress without paying the costs, as Charles Darwin showed.

MR. HUTCHINS: This is the kind of weapon, I believe, which should be used, if at all, only as a last resort in self-defense. At the time that this bomb was dropped the American authorities knew that Russia was going to enter the war. It was said that Japan was blockaded and that its cities were burned out. All the evidence points to the fact that the use of this bomb was unnecessary. Therefore, the United States has lost its moral prestige.

MR. GUSTAVSON: At the very least we might have used another method. We might have demonstrated the effectiveness of the bomb by calling our shot in advance and by giving the Japanese an opportunity to watch us drop a bomb on an uninhabited part of Japan and then calling upon Japan to surrender.

MR. HUTCHINS: Perhaps the future is more important than the past. Ogburn, as a social forecaster, what seems most important to you about the atomic bomb?

MR. OGBURN: This may well be one of the most important inventions of all time. The explosive energy in the atomic bomb, in my opinion, undoubtedly brightens the prospect for abolishing war, but if, in addition, atomic energy is harnessed, we will usher in the "Atomic Age" and may produce sweeping changes comparable to those of the Industrial Revolution, which was brought in by steam. The Industrial Revolution, we all know, created our cities, made nations bigger, shifted world power, weakened the family, revolutionized agriculture, built an enormous industry, and led to the creation of powerful central government—more powerful than the world had ever known.

MR. HUTCHINS: Gustavson, you are a scientist. What do you say?

MR. GUSTAVSON: I would say that the bomb teaches us the value of fundamental research. The work done by Professor Fermi and others on the effect of the neutron on the uranium atom was research carried on out of curiosity and for the general purpose of increasing human understanding. There was no specific purpose of producing atomic energy—certainly no intention of producing world-shattering bombs. The basic work was an attempt to find out about the universe in which we live. To me that is the important lesson; and that is the way all really important discoveries are made.

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MR. HUTCHINS: My own conviction is that the moral burden which this discovery places upon the peoples of the earth and the necessity of a world organization to control this force are most important. Let us take up in order the social and industrial consequences, the implications for research, and the impact of this discovery upon war, peace, and world organization.

MR. OGBURN: Let us first see what we are talking about. If we are talking about the explosive capacities of uranium—which is the only thing that is known definitely and publicly now—that is one thing; if we are talking about harnessing power from uranium and regulating its flow through machines—which is something I have not yet heard whether we can do—then the social consequences, of course, will be much greater; but if we are talking about releasing atomic energy not from uranium alone but from other and more abundant materials—such as, for instance, clay or water—and of this I am skeptical as well as uninformed—then, in my judgment, no human imagination can encompass the consequences.

MR. GUSTAVSON: This is the most important discovery that has been made since the discovery of fire. It is more important than all the inventions since the Industrial Revolution combined. This discovery is the answer to the dream of the alchemist. We are dealing here with the transmutation of elements, the destruction of matter, and the liberation of tremendous quantities of energy—energy the intensity of which defies description. For example, when dynamite explodes, there is an intensity represented by about four volts. We are now talking about something of the order of two hundred million volts.

MR. OGBURN: This is very impressive, but inventions are nearly always overpromised. Ninety-five per cent of them never materialize at all. Take, for instance, the singing wire or the talking book, which were invented in the 1890's. They have not been put to public use yet. Or take another invention—that of gas warfare—which put fear in our hearts and which was certainly overpromised twenty-five years ago at the end of the first World War. It has never materialized up to its promises. My calculations show that it takes, on the average, about thirty-five years for an invention to materialize, and sometimes it takes two or three hundred years or longer. All inventions of the past which I have studied have been resisted. Let us look at the example of prefabricated housing, for instance. We could have had it fifty years ago, but instead it has been resisted by the building trades, certain real estate interests, and, of course, the mortgage companies. They do not want it.

MR. GUSTAVSON: It seems to me that the trend today, however, is away from resistance and toward too-ready acceptance of new things. As a people, we are credulous and volatile rather than skeptical and slow to change. Take vitamins and nylon, for example.

MR. OGBURN: We must not allow ourselves to begin talking like Jules Verne.

MR. HUTCHINS: Maybe this time Jules is justified.

MR. OGBURN: If Jules Verne were sitting around the ROUND TABLE this morning, he would be using the atomic bomb for organizing a war on Mars.

But there are many, many forces which slow up change. Civilization is merely a complicated mass of interrelationships, like a huge piece of machinery. We cannot change one part without changing many parts. To bring in a regulated atomic power means, for instance, changing railroads, electric-power systems, banks, factories, and many other types of social organizations. All this takes time. We do not get inventions adopted overnight.

MR. GUSTAVSON: We may not get inventions adopted overnight, but we do know certain things about this discovery. We do know that we get out of it incredible heat, incredible power, incredible radioactivity, and new elements.

MR. OGBURN: But there is a third factor, it seems to me, which slows up the use of inventions. An invention will not be used if it costs too much. President Truman told us that atomic energy cannot compete, in terms of costs, with coal or electricity at this stage. The first two atomic bombs cost, it is reported, one billion dollars apiece. One cannot pick up a piece of U-235 as cheaply as one can pick up a piece of coal and put it in the furnace. The question still is whether it will be brought down cheap enough, and this we certainly do not know yet.²

² President Truman, in his statement announcing the use of the atomic bomb, said, in part:

“ . . . Before 1939 it was the accepted belief of scientists that it was theoretically possible to release atomic energy. But no one knew any practical method of doing it.

“By 1942, however, we knew that the Germans were working feverishly to find a way to add atomic energy to the other engines of war with which they hoped to enslave the world. But they failed. We may be grateful to Providence that the Germans got the V1's and the V2's late and in limited quantities and even more grateful that they did not get the atomic bomb at all.

“The battle of the laboratories held fateful risks for us as well as the battles of the air, land, and sea, and we have now won the battle of the laboratories as we have won the other battles.

“Beginning in 1940, before Pearl Harbor, scientific knowledge useful in the war was pooled between the United States and Great Britain, and many priceless helps to our victories have come from that arrangement. Under that general policy, the research on the atomic bomb was begun. With American and British scientists working together, we entered the race of discovery against the Germans.

“The United States had available the large number of scientists of distinction in the many needed areas of knowledge. It had the tremendous industrial and financial re-

MR. HUTCHINS: Then let us assume that we have a fundamental discovery, but that it is in a very early stage. What are the social consequences, Ogburn, that you as a social scientist can reasonably foresee, even at this stage?

MR. OGBURN: I have been trying to argue that we need not get a case of the jitters and that inventions, though they disturb our sense of security, have a way of developing slowly. They develop against social inertia and in the face of resistances arising from the complicated nature of our society, and they come with the handicap of high costs. But to answer your question. If we cannot abolish war, we can pretty well count on a considerable effect on the layout of our cities and on city planning. The cities have already been dispersed by the automobile and more recently by the bomber. If explosives of this kind can reach them, our cities will be further dispersed and spread outward. Thus, this is a tendency which is already underway.

MR. GUSTAVSON: Can we look forward to more leisure?

MR. OGBURN: Any great new use of energy has the potentialities of reducing

sources necessary for the project, and they could be devoted to it without undue impairment of other vital war work.

"In the United States the laboratory work and the production plants, on which a substantial start had already been made, would be out of reach of enemy bombing, while at that time Britain was exposed to constant air attack and was still threatened with the possibility of invasion.

"For these reasons Prime Minister Churchill and President Roosevelt agreed that it was wise to carry on the project here. . . .

"The fact that we can release atomic energy ushers in a new era in man's understanding of nature's forces. Atomic energy may in the future supplement the power that now comes from coal, oil, and falling water, but at present it cannot be produced on a basis to compete with them commercially. Before that comes there must be a long period of intensive research.

"It has never been the habit of the scientists of this country or the policy of this government to withhold from the world scientific knowledge. Normally, therefore, everything about the work with atomic energy would be made public.

"But under present circumstances it is not intended to divulge the technical processes of production of all the military applications, pending further examination of possible methods of protecting us and the rest of the world from the danger of sudden destruction.

"I shall recommend that the Congress of the United States consider promptly the establishment of an appropriate commission to control the production and use of atomic power within the United States. I shall give further consideration and make further recommendations to the Congress as to how atomic power can become a powerful and forceful influence toward the maintenance of world peace" (*New York Herald Tribune*, August 7, 1945).

and, I may say, even abolishing physical toil. We might, if we look forward into the future, even have factories without any laborers in them at all; but, of course, this will all come slowly.

MR. GUSTAVSON: Could we not have technological unemployment on a scale of which we have never dreamed?

MR. OGBURN: We could, if the inventions came quickly enough, but most inventions produce technological unemployment only temporarily. Unemployment, in the main, is really caused by the business cycle, fluctuations, and by population changes. I have calculated, for instance, that during the depressions of the 1930's only 15 per cent of it was technological.

MR. GUSTAVSON: Remember, this is a fundamental discovery of very fundamental character. It could affect our whole industrial civilization.

MR. HUTCHINS: What about the effect on the standard of living?

MR. OGBURN: It will make the atomic age an age of abundance. I am particularly excited, though, about the possibilities for transportation, which I have been studying recently. If atomic energy could be put in a rocket—and that does not seem to be very difficult—and if these rockets could be kept cool and slowed near their destination, it would be perfectly possible, I think, to travel three thousand miles an hour. This would mean that we could leave New York one day and arrive in China the day before.

MR. HUTCHINS: Who is talking like Jules Verne now?

MR. GUSTAVSON: Let us not forget that the bomb is the end product of a series of discoveries. In all probability the liberation of atomic power, in a fashion that can be controlled for industry, will likely be much simpler than the making of the bomb.

MR. HUTCHINS: I am interested in the suggestion that this discovery will favor the big industries—at least in its present stage where we have relatively rare materials and a relatively expensive process. How do you gentlemen feel about public versus private control of this material and this process?

MR. OGBURN: Let me give some illustrations on this point. Most of our power inventions which we have now have developed big industries of the public utility type—electricity, railroads, aviation. These are certainly not the industries for small businesses. I suspect that the development of atomic energy will be in this class. It will tend to strengthen the big industries. It is very likely, by the way, to speed us further on the "road to serfdom," as the term is now used. It will tend to reinforce movements toward monopoly and toward cartels if, of course, we do not do something about it. But if it can be used in very small packages, then it may, of course, not accentuate this tendency. Most probably, however,

it will put tremendous power in the hands of large industrial units. That brings us to the question of what we are going to do about it.

MR. GUSTAVSON: It seems to me that it will go about the way the development of power in general has gone. We have seen the government step into the power problem to control the great water resources for the development of electrical power. We are increasingly coming to the conclusion, I believe, that anything so fundamental to our economic structure as electricity, or power in general, has to be something that is government controlled. The government would logically have a lot to say about the development and distribution of atomic power.

MR. OGBURN: I agree. Military reasons, of course, are added to the economic reasons in this case.

MR. HUTCHINS: You both thus feel that on the military side there is no question but that the government will have to continue in control of this process and the materials used in it. But if large industries are the only ones which are in a position to develop the process or exploit the material at the present time, then we shall have to have governmental regulation of those industries.

What are the implications of this discovery for medicine and for health and for biology?

MR. GUSTAVSON: They are tremendous, of course. The radioactivity associated with all this work has great possibilities for good and for harm—industrial hazards, for example, in the new industries—the exposure of workmen to dangers which we never suspected before. We are going to use these radioactive materials, too, in the study of disease processes. We are going to use them in attempting to follow the fundamental researches in biology. The implications for public health, as I said, probably cannot be overstated.

MR. HUTCHINS: You think that we may have as great a revolution in medical treatment and in biological investigation as we can see ahead of us in the physical sciences and in technology, is that correct?

MR. GUSTAVSON: There is no question about it!

MR. HUTCHINS: We have now come to the second main point of discussion on this ROUND TABLE. If the government has succeeded in creating a notable cure with two billion dollars and the concentrated effort of thousands of scientists over four or five years, why could we not ask that the government devote the same money and effort to the elimination of some of the already existing curses such as cancer, influenza, venereal disease, unemployment at home, or starvation abroad?

MR. GUSTAVSON: The important point here is that while it is relatively easy to get large sums of money to study the cancer problem which you have sug-

gested, it is by no means easy to get large sums of money to study the fundamental properties of living matter. In the last analysis, solution of the cancer problem will be a by-product of fundamental research on how the cell divides, why it divides, and so forth. We should remember that the nucleus of the cell is just as important in biology as the nucleus of the atom is to nuclear physics. We should remember, as I said before, that, when Professor Fermi did some of the fundamental work leading to the atomic bomb, bombs were the furthest thing away from his thinking. Similarly, the cure for cancer will come indirectly. It will probably come out of fundamental research and not out of the study of cancer.

MR. HUTCHINS: But does this not mean that such researches would have to be centered in universities rather than in industry or under the auspices of government?

MR. OGBURN: The history of research has shown that industry is interested in applied research and that government is interested, in the main, in contemporary applications. The only fundamental research of any significance has been done at the universities. Take, for instance, radio broadcasting and radar. They were dependent upon the discovery through pure research and science of Hertzian waves.

MR. GUSTAVSON: After all, where did the government turn in its hour of great fear? It did not turn to industry, and it did not turn to itself; it turned to the universities.

MR. OGBURN: The atomic bomb has now put to the universities the biggest challenge which they ever faced, in my judgment. We have to know what to do with the dangerous weapon which we have created. Without liberal education and spiritual education it may become our master and our destroyer. What the natural scientists do is to unloose these new inventions which cause a reorganization of society, a reorganization of our economic institutions and of our social institutions, and always, what should not be forgotten, a reevaluation of our ideologies. But here we are, sitting around trying to give the answers in a half-hour on this ROUND TABLE, when it cannot be done. It took two billion dollars and three years, so we are told, to produce an atomic bomb. If the various social scientists had two billion dollars and three years of research, maybe we could give better answers, but I think maybe that we ought to consider declaring a moratorium on all pure-science and natural-science development until we social scientists can catch up.

MR. HUTCHINS: I understand that you are not seriously suggesting a moratorium. You are suggesting that Gustavson and I should get out and raise two billion dollars for the support of social science research. We will be glad to do that.

MR. OGBURN: That is chicken feed, Hutchins, mere chicken feed! We need much more than that.

MR. HUTCHINS: I would like to consider whether, even if we had two billion dollars for social science research, we could have any effect upon society if society were not educated enough to accept the results.

MR. OGBURN: That, of course, is the basic problem.

MR. HUTCHINS: I want to ask whether it is not necessary, therefore—and whether this is not another of the responsibilities of the university—to develop liberal education for all.

MR. GUSTAVSON: Quite right! Even Harvard and Yale and the University of Colorado, my former institution, have at last decided to devote themselves to general education as a preliminary to specialization. It would seem to me that this must be the trend and that it must be tremendously accelerated.

MR. HUTCHINS: If we are going to have a society which knows what to do with these constant surprises from the physical scientists, we are going to have to have an entirely different level of general intelligence in the community from the one which we have been used to in the past.

MR. OGBURN: That, Hutchins, is really the challenge of the atomic bomb. The bomb produced a sort of paralysis in Japan, but also, we would like to note that the first week in the atomic-bomb age has given the rest of the world a very bad state of jitters, to say the least. What we really fear, I think, is not the bomb so much as the unknown. But we need not fear it if we can control the development and control the knowledge and use it consciously and confidently for good and not for evil.

MR. HUTCHINS: That brings us, does it not, to our last point, which is the military and political significance of atomic force?

MR. OGBURN: It is an interesting fact that nations in the past, throughout the long history of mankind, have risen and fallen pretty much on the basis of inventions. England dominated the world during the nineteenth century. She did it, because the harnessing of the first mechanical power—steam—brought the Industrial Revolution to England fifty years before it did to any country on the Continent. Prior to that, France and other west European countries displaced the Mediterranean countries, because agricultural inventions made the river valleys of France such powerful forces. Before that, the Mediterranean powers rose because of another invention—the boat. Now, along comes a still more important development—atomic energy. Will there be a realignment of international powers?

MR. HUTCHINS: What I get out of what you have been saying is that the

United States is going to dominate the world, because the United States is sitting on this secret.

MR. GUSTAVSON: If the United States tries to sit on this secret, it will make itself the most hated power on earth. But we cannot sit on this secret. If the history of science shows anything, it shows that discoveries are made practically simultaneously in several parts of the world and that no single nation develops an idea of this kind. As you well know, Hutchins, the men who are going to work on nuclear physics at the University of Chicago come from Italy, from Hungary, from England, from Canada, from the United States. This bomb was a composite that grew out of the efforts of many people. If any one nation attempted to isolate itself scientifically, it would soon be outstripped by the others which would not be parties to the secrecy.

MR. OGBURN: Brains, in a hereditary sense, as the biologists know, are pretty well generally distributed over the world. The thing which we have to look out for, though, is what the distribution of the natural resources is, for this new source of power. Where do we find uranium? In Colorado, Utah, and Canada, but it also exists in Czechoslovakia, in Africa, and in Russia. That puts it in the hands of what we call the "peace-loving nations." May I say that I hope that they will continue to love peace.

MR. GUSTAVSON: Your implication that the release of atomic energy is limited to uranium is open to question. In all probability we shall learn to apply the process to other more abundant elements. It seems to me that this discovery really equalizes the nations by placing atomic power, with all its potentialities, into the hands of all small nations. What we have done is the equivalent of placing a slingshot in the hands of a David.

MR. OGBURN: Not yet, not yet. The chances are strong that the difference between the big nations and the small nations will be increased rather than diminished. That is what happened with the tank and the bomber. They practically killed off the small nations as effective factors in the distribution of power. The atomic bomb will very likely strengthen the big nation, because, whatever the little one can do, the big can do better and quicker.

MR. GUSTAVSON: But your assumption is that it takes tremendous industry and a lot of airplanes to do this sort of job. It is altogether possible that relatively small numbers of workers in a small country, such as Denmark, could develop all the facilities which are necessary without a single bomber. With only a runway, a rocket, and an atomic bomb a man in Copenhagen might be able to destroy Berlin.

MR. OGBURN: The big nation could still produce bigger, better, and quicker results. What do you think, Hutchins?

MR. HUTCHINS: The first thing that I think is that peacetime military training in the United States now becomes an irrelevant issue. We do not need a big army to operate an atomic bomb; we do not need much of an air force. Peacetime conscription is a soporific. We should not rely upon large masses of half-trained men; we should pin our faith upon scientific research.

MR. GUSTAVSON: At the present stage uranium is known to be distributed only in certain places. Manpower and industrial strength related to its use are important. The issue is whether, as scientific research proceeds, it will not result in a further redistribution of power which might bring the smaller nations back on the same level. But the upshot in any case is that the atomic bomb cannot be suppressed. Ogburn, by talking about the abolition of war, did you mean that something like the United Nations organization might abolish war by agreement now that the atomic bomb has fallen?

MR. OGBURN: It is the best chance to banish war which we have had since the League of Nations—at least to banish it for a time—a very long time.

MR. HUTCHINS: I do not follow you at all. After the last war it was said that the airplane and the TNT bomb were going to be so horrible that nobody would ever fight again. And Hitler began to fight as soon as he saw that he had industrial resources and a political position adequate to give him a good chance of success. Is that not always going to be the case? We are not going to abolish war merely by making it horrible.

MR. GUSTAVSON: People are going to fight for whatever they think that they can win. They always have, and they always will.

MR. OGBURN: The Japanese apparently thought that it was too horrible. But do not misunderstand me, I am not saying that we can banish war forever. All that we can foresee is about twenty or twenty-five years ahead. The problem is practically, to make war much more difficult. If the atomic bomb has all these destructive capacities, it may be our golden opportunity.

MR. HUTCHINS: We have always had this chance.

MR. OGBURN: But we did not have the atomic bomb.

MR. HUTCHINS: The whole question is: What is at stake and what are our chances? If a man has a chance to dominate the world through the control of atomic energy, that is a very large stake. And if he has, through the advances made by the scientists in his country, an opportunity to use this atomic force in such a way as to justify him in thinking that he has the edge on his enemies, he will take advantage of his situation and start another international conflagration. How are we going to prevent this? Did I understand you to say that you thought that we could have an international agreement which would either stop

scientific progress in weapons or make every nation feel that it should never take advantage of such progress?

MR. OGBURN: Such an agreement is not impossible, certainly.

MR. HUTCHINS: The question is not whether it is impossible but whether it would be effective. Up to last Monday, I must confess that I did not have much hope for a world state. I have believed that no moral basis for it existed and that we had no world conscience and no sense of world community sufficient to keep a world state together. But the alternatives now seem clear. One is world suicide; another is agreement among sovereign states to abstain from using the bomb. This will not be effective. The only hope, therefore, of abolishing war is through the monopoly of atomic force by a world organization.

MR. OGBURN: But that is a thousand years off.

MR. HUTCHINS: Remember that Leon Bloy,³ the French philosopher, referred to the good news of damnation, doubtless on the theory that none of us would be Christians if we were not afraid of perpetual hell-fire. It may be that the atomic bomb is the good news of damnation, that it may frighten us into that Christian character and those righteous actions and those positive political steps necessary to the creation of a world society, not a thousand or five hundred years hence, but now.

³ See Raïssa Maritain, *Adventures in Grace* (New York: Longmans, Green & Co., 1945).



The ROUND TABLE, oldest education program continuously on the air, departed from its usual procedure to present a special script broadcast today. The participants met in advance, prepared a topical outline, exchanged data and views, and prepared statements of their positions. The opinion of each speaker is his own and in no way involves the responsibility of either the University of Chicago or the National Broadcasting Company. The supplementary information in this transcript has been developed by staff research and is not to be considered as representing the opinions of the ROUND TABLE speakers.



What Do *You* Think?

1. How can we, if we are to control for good ends the achievements of the physical sciences, improve the level of general intelligence of the community?
2. To what extent do you think that modern man's problems lie in his failure to adjust himself quickly enough to the new demands of a technical age? Do you think that "the age of science," by enhancing man's material existence, has caused him generally to concentrate upon the material side of life to the exclusion of other values?
3. What is the role of education in defining values for mankind? Do you agree that the atomic bomb has given the universities "the greatest challenge" they have ever faced? Without spiritual and liberal education, may the atomic bomb become our master and our destroyer?
4. Is man any more or less a moral creature today than he has been at other periods of history? Is war an indication of man's moral failure? To what extent? How can scientific knowledge be made the servant of great ends?
5. 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" that might cause this new invention to develop slowly? Would you favor a "moratorium" on natural-science research until the social sciences catch up?
6. Once at war, do you believe that there is a real moral distinction between the use of one kind of weapon and another? Do you believe that we have "lost our moral prestige" by dropping the atomic bomb? Why or why not?
7. Has the atomic bomb intensified the obligation and responsibility of men for their fellow-men? Does it make the achievement of a world community the primary requisite today? Is there now a basis of moral responsibility which may bind us to our neighbors for common goals? What does Hutchins mean by "the good news of damnation"? Discuss.



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- "Science and Democracy," *New Republic*, June 11, 1945.



The People Say

The following letters are representative of the views expressed by the ROUND TABLE audience on "Patents and Monopoly," broadcast August 5, 1945.

*

An Excellent Purpose Served

I enjoyed very much the program which you had yesterday relating to patents, and I feel sure that it served an excellent purpose.—*A listener from New York, New York.*

*

A Worth-while Service

I want to congratulate you upon the fine job that was done in organizing this program on the patent system. I believe that you performed a worth-while service to business, the patent system, and inventors in providing such an interesting outline for discussion.—*A listener from Chicago, Illinois.*

*

An Inventor's Opinion

As one of the large group of those who regard themselves as inventors—a group which was not represented in your discussion—I beg to add something to that discussion. . . . I would especially recommend that patent attorneys come under more strict surveillance by the Patent Office; that the quality of their services and the money they obtain from clients be subject to close scrutiny; that a clearing-house be established through which all sales of patents and all contracts must pass where it would be assured that the inventor got a fair deal; that a court of review be set up to which the inventor could appeal if he believes that he has been imposed upon because of bad contracts; that a fund be established for subsidizing—or "grub-staking"—the struggling inventor if his idea holds promise of important improvement and that the government, thereby, become a partner in the royalties or revenues from the patent; and

that a patent be effective for twenty years but that after ten years the holder of the patent would be forced to grant licenses to anyone so desiring under uniform terms prescribed by the aforesaid clearing-house.—*A listener from Norfolk, Virginia.*

*

Advantages of Licensing

In the matter of licensing patents, I was surprised that nothing was mentioned of the method adopted by the auto industry. They have an interchange which automatically grants use to every member of their association at a stipulated and agreed royalty after the owner of the patent has had one year's exclusive use of it. To that system is attributed the tremendous success and progress of the auto industry.

It seems to me that, while there may be some honest and justifiable criticism to compulsory licensing, there could be some way of bringing its overpowering advantages to the forefront in order to bring about the adoption of voluntary rather than compulsory means.—*A listener from the Bronx, New York.*

*

Suppressing Patent Rights?

I listened with interest to today's discussion on patents, but I wish that some mention had been made of the practice of buying patent rights by large companies for purposes of suppressing them. Of course, these patents expire like others, but, in the meantime, seventeen or twenty or more years have passed during which the public has been denied the privilege and advantages which the patents in question would have offered.—*A listener from Winnipeg, Canada.*

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1:30 P.M. EASTERN WAR TIME

City	Call Letters	Kilo-cycles	City	Call Letters	Kilo-cycles
Ashville, N.C.	WISE	1230	Manchester, N.H.	WFEA	1370
Atlanta, Ga.	WSB	750	Martinsville, Va.	WMVA	1450
Augusta, Me.	WBDO	1400	Miami, Fla.	WIOD	610
Boston, Mass.	WBZ	1030	New York, N.Y.	WEAF	660
Buffalo, N.Y.	WBEN	930	Norfolk, Va.	WTAR	790
Charleston, S.C.	WTMA	1250	Portland, Me.	WCSH	970
Charleston, W.Va.	WGKV	1490	Providence, R.I.	WJAR	920
Charlotte, N.C.	WSOC	1240	Raleigh, N.C.	WPTF	680
Cleveland, Ohio	WTAM	1100	Reading, Pa.	WEEU	850
Cumberland, Md.	WTBO	1450	Rochester, N.Y.	WHEM	1180
Easton, Pa.	WEST	1400	Springfield, Mass.	WBAZ	1030
Elmira, N.Y.	WENY	1230	Tampa, Fla.	WFLA	970
Harrisburg, Pa.	WKBO	1230	Washington, D.C.	WRC	980
Jacksonville, Fla.	WJAX	930	Wilmington, Del.	WDEL	1150
Lancaster, Pa.	WGAL	1490	Winston-Salem, N.C.	WSJS	600
Lewistown, Pa.	WMRF	1490	York, Pa.	WORK	1350

12:30 P.M. CENTRAL WAR TIME

Bismarck, N.D.	KFYR	550	Mobile, Ala.	WALA	1410
Chicago, Ill.	WMAQ	670	Monroe, La.	KNOE	1450
Des Moines, Iowa	WHO	1040	New Orleans, La.	WSMB	1350
Duluth, Minn., and Superior, Wis.	WEBC	1320	North Platte, Neb.	KODY	1240
Evansville, Ind.	WGBF	1250	Pittsburgh, Kan.	KOAM	810
Fargo, N.D.	WDAY	970	Saginaw and Bay City, Mich.	WSAM	1400
Grand Rapids, Mich.	WOOD	1300	St. Cloud, Minn.	KFAM	1450
Hibbing, Minn.	WMFG	1240	Shreveport, La.	KTBS	1480
La Crosse, Wis.	WKHB	1410	Springfield, Mo.	KGBX	1260
Lake Charles, La.	KPLC	1490	Terre Haute, Ind.	WBOW	1230
Marinette, Wis.	WMAM	570	Tulsa, Okla.	KVOO	1170
Milwaukee, Wis.	WTMJ	620	Virginia, Minn.	WHLB	1400
Minneapolis and St. Paul, Minn.	KSTP	1500	Wichita, Kan.	KANS	1240
			Zanesville, Ohio	WHIZ	1240

11:30 A.M. MOUNTAIN WAR TIME

Albuquerque, N.M.	KOB	770	Pocatello, Idaho	KSEI	930
Bozeman, Mont.	KRBM	1450	Prescott, Ariz.	KYCA	1490
Butte, Mont.	KGIR	1370	Safford, Ariz.	KGLU	1450
Denver, Colo.	KOA	850	Salt Lake City, Utah	KDYL	1320
Globe, Ariz.	KWJB	1240	Tucson, Ariz.	KVOA	1200
Helena, Mont.	KPFA	1240	Yuma, Ariz.	KYUM	1240
Phoenix, Ariz.	KTAR	620			

10:30 A.M. PACIFIC WAR TIME

Fresno, Calif.	KMJ	580	San Diego, Calif.	KFSB	600
Medford, Ore.	KMED	1440	Seattle, Wash.	KOMO	1000
Portland, Ore.	KGW	620	Spokane, Wash.	KHQ	590

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Hutchinson, Kan.	KWBW	1450	St. Louis, Mo.	KSD	550
Los Angeles, Calif.	KFI	640	San Francisco, Calif.	KPO	680
Mankato, Minn.	KYSM	1230	Twin Falls, Idaho	KTFI	1270

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