

PHYSICS

Control of Atomic Power

Scientists who have been engaged in research on the bomb at Oak Ridge, Tenn., urge that finding a way for international control is the only solution.

This is the full text of a statement on the future of atomic energy prepared by a group of scientists engaged in research on the bomb at Oak Ridge, Tenn., laboratory. It is an analysis of the problem that is now being considered by Congress and the world.

► THE DEVELOPMENT and use of the atomic bomb has introduced an important new element into world politics and has created a situation fraught with grave danger for our nation and the world. Many of the scientists who have been working on atomic bombs as a necessary military measure in time of national peril did so with misgivings concerning the ultimate repercussions of such a discovery. Consequently, they have been thinking about this situation for a considerably longer time than was possible for the public. We feel that it is our duty to present to the public the basic facts concerning the atomic bomb and their implications for United States foreign policy. Only by a full realization of these facts can the citizens of this country intelligently participate in making decisions that the unleashing of atomic energy compels us to make. If wrong decisions are made, it may mean the destruction of our cities, horrible death for millions of our people, and possibly the end of our nation.

We propose to discuss this problem by analyzing possible courses of action for our government.

No Change in Present International Relations

Alternative I

Many Americans believe, either after serious consideration or because of inadequate information, that no special change in our national policy is necessary. Arguments supporting this view are that the atomic bomb does not change the basic causes of international friction and war, that it is not a development of sufficient magnitude to change the nature of warfare, that an effective defense is sure to be found, and that moral pressure and the fear of retaliation will pre-

vent the use of atomic bombs or prevent war altogether.

Importance of the Atomic Bomb

The primary feature of the atomic bomb is its tremendous destructive power. The newspaper accounts of the destruction of Hiroshima and Nagasaki are adequate for an appraisal of the present destructiveness. By using more bombs, larger bombs and more efficient bombs it will be possible in the near future to completely destroy the bulk of the population, industry and military strength of any nation within a few weeks. Moreover, aviation and rocket developments might enable this to be accomplished within a few hours, without possibility of effective retaliation. Alternately, strategic locations may be mined in advance by agents of foreign nations. A factor of such extreme destructiveness cannot be neglected in formulating our foreign policy. By constituting a serious threat to the safety of every nation, it intensifies the causes of friction and of war.

Possibility of Specific Defense

In spite of the adage, "to each offensive weapon there has been found a defense," we as scientists can offer no hope of a specific defense against the atomic bomb. The only immediate defensive measures are retaliation, counter-offensive or "preventive" warfare, but these will not restore the ruins of our cities or revive the millions of our dead. Dispersal of population and industry over wide areas or underground can reduce the efficiency of atomic bomb raids, but cannot be considered an adequate permanent defense.

Moral Sanctions

Moral considerations did not prevent the use of atomic bombs against Japan, but it might be argued that the population at large was not consulted in this decision. It is evident, however, that the Allied peoples have, to a large extent, approved the decision subsequently. In time of war, moral sanctions have never prevented the use of any weapon, no

matter how terrible. Moreover, those having control over the use of atomic bombs may not be subject to moral pressure of the world in general.

Fear of Retaliation

In the past, fear of retaliation has never been a deterrent to aggressors who thought they had a chance to win. Fear of being subjected to atomic bomb attacks may, in fact, enhance the possibility that a nation will itself use them as a preventive measure.

As a result of these considerations it is evident that the world situation is definitely and considerably altered by the introduction of the atomic bomb, and that this factor must be given major consideration in our foreign policy.

United States Supremacy In Atomic Warfare

Alternative II

Many people feel that the security of the United States can best be preserved by maintaining supremacy in atomic warfare. They propose that we keep the secret of making atomic bombs, that we seek to corner the strategic materials, that we produce more numerous and more deadly bombs, and disperse our population and industries.

Keep It Secret

Those who advocate that the secret of the atomic bomb be kept mislead our people rather than other countries. *There are no longer any fundamental secrets about the atomic bomb.* The government has made public the broad outline of the discovery and methods which led to success. The remaining "secrets" are scientific and engineering details. It would be foolish to suppose that scientists and engineers in other countries would not be able to redevelop at least one of the methods we have used or develop new methods. It took the Anglo-Americans three years to achieve the transformation from the laboratory to the plant scale. Working with the knowledge that *this transformation has actually been achieved*, even those nations with lesser resources than those of the United States will be able to produce atomic bombs within two to five years.

A very dangerous consequence of a policy of secrecy is that while spurring other nations to develop atomic bombs, by withholding detailed information from the majority of our own scientists we will artificially channel and sterilize the further development of nuclear physics and chemistry in our own country.

U. S. Control of Raw Materials

It has been suggested that a way to monopolize atomic bombs is for the Anglo-Americans to control the raw materials necessary for their fabrication. The world-wide distribution of uranium ores does not permit us to achieve this control unilaterally, except by conquest. Before the war there were known uranium deposits in Canada, Belgium, Czechoslovakia, and Russia. Other deposits have undoubtedly been discovered since. It would be foolhardy to rely on the assumption that we, alone or together with Britain, can deprive the rest of the world of access to enough uranium for the production of atomic explosives.

Bigger and Better Bombs

If we cannot hope to *monopolize* atomic power, cannot we make our future secure by producing more and better bombs than the rest of the world?

Producing more and better bombs may be necessary for what security it does give during the next five years. However, we want to warn emphatically that more and better bombs cannot provide us with lasting security. Because of the tremendous potential destructiveness of atomic bombs, and because of the industrial and population concentration of the United States, having more and better bombs is no defense. *Once a nation possesses a certain minimum number of bombs there is no great advantage in having more.* In a few years, a nation with a small number of atomic bombs

carried by rockets or planted as mines in our cities, could in a few minutes destroy most of the industrial resources of the United States and much of its population.

Furthermore, if we have more and better bombs, another nation may fear, justifiably or not, an attack by us, and deem it necessary to attack first.

Decentralization

The only known possible defense to existing atomic bombs is the dispersal of industry. By not presenting single targets of sufficient concentration, the effect of atomic bombs can then be reduced. However, there is no reason to doubt that in the future, atomic bombs of sufficient number and destructiveness can become available so that decentralization of industry will be only a partial defense. This would also be a difficult and costly program, resulting in a severe economic dislocation and disorganization. Furthermore, it is doubtful whether the United States could carry out a program of decentralizing industry and population without exercising totalitarian powers which would destroy both democracy and free enterprise.

Immediate World Conquest

Alternative III

If we reveal no more information to other nations, the United States may maintain leadership for a few years. It is almost certain that after five years all of the great powers will, if not prevented by force or agreement, possess atomic bombs in such number, size and efficiency that raids can produce tremendously more destruction than that inflicted on Hiroshima and Nagasaki. Science can promise no defense against such raids. Because of the industrial concentration of the United States and the congestion of our cities, we are especially vulnerable to such attacks and it is entirely possible if we do not decentralize our industries, that most of our industrial potential could be wiped out by such raids in the first ten minutes of war.

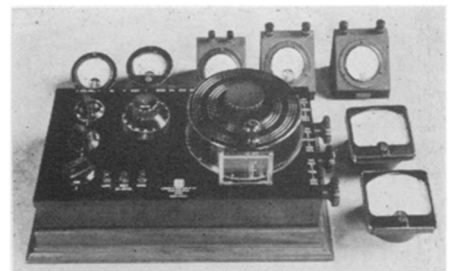
This means that after five years the United States cannot rely for its security upon producing more numerous and more deadly atomic bombs. This knowledge has led some to propose that the United States insure its security by forcibly preventing other nations from producing atomic bombs. Since no nation would peacefully consent to our suppres-

sion of their development of atomic power, this *course of action means that we must conquer the world within the next five years*, before the other nations of the world achieve equality in atomic power. At the present stage of atomic bomb development, such world conquest would be neither quick nor certain. Clearly, such a policy is against the democratic tradition and expressed views of the American people. In fact, it is hard to see in what way such a course of action differs from that of the Nazis.

International Control Of Atomic Power

Alternative IV

International control of atomic power is another alternative that has been widely proposed. No specific plans have been prepared, and we do not intend to offer one here. We recognize that any such plan involves many difficulties, and may require that in order to preserve the peace of the world, we forego some potential peaceful applications of atomic power and some phases of our national sovereignty. The alternatives are clear. If we ignore the potentialities of atomic



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warfare, in less than a generation we may find ourselves on the receiving end of atomic raids. If we seek to achieve our own security through supremacy in atomic warfare, we will find that in ten years the whole world is as adequately armed as we, and that the threat of imminent destruction will bring about a "preventive" war. If we recognize that our present leadership in atomic power can last at the most several years, and we attempt to dominate the world, we will find ourselves immediately involved in another and greater war in violation of our democratic moral code and with no assurance of victory.

In view of the disastrous nature of these alternatives, we must expend every effort to achieve international cooperation and control as the only real and possible long-term solution.

We strongly urge the people of the United States and their leaders to think about, and find a means for, the international control of atomic power. The United States must exert its leadership to promote world peace. The people of the United States, together with the peoples of the rest of the world, must demand that their leaders work together to find the means of effective international cooperation on atomic power. They must not fail. The alternatives lead to world suicide.

Science News Letter, October 20, 1945

MEDICINE

Artery-Cutting Operation Relieves Migraine Headache

► AN ARTERY-cutting operation that brings relief, apparently permanently, in one type of migraine headache is reported by Dr. Samuel B. Nadler, of Tulane University School of Medicine, in the *Journal of the American Medical Association*, (Sept. 29).

The particular headache comes in periodic attacks of throbbing pain, frequently "unbearable," over the right or left temple or both. The pain may radiate over a larger part of the head. Stomach and intestinal upsets often accompany the headache. Dizziness and the visual disturbances that come in some cases of migraine were not present with the headaches, Dr. Nadler reports.

Pressing with the fingers on the temporal artery on the side of the headache abolished the throbbing pain and most of the continuous dull ache that patients also suffered. Injecting a local anesthetic into the tissue around the artery brought relief, often within one minute, which lasted from several hours to several days.

More prolonged relief, two to 11 months so far, was achieved by the operation in which the artery was cut and tied. The operation was successful in five

of eight patients whom Dr. Nadler has seen with this type of headache during the past year. The other three had less frequent attacks and preferred to have the injections of local anesthetic instead of the operation.

Science News Letter, October 20, 1945

AERONAUTICS

Great Increase In Aviation Courses

► AMERICAN youth, long air-minded, has become increasingly so during the war, and additional millions of students of both sexes will be enrolled in high school and college aviation courses this fall.

Since last October more than \$38,000,000 worth of aircraft equipment has been turned over to non-profit schools in an Army Air Force project. Additional obsolete instruments, engines and complete planes will be available to schools in the next few months, through the Education Disposal Section of Reconstruction Finance Corporation.

An estimated 96% of American colleges and universities now recognize aeronautics as an elective science, and about half accept it as a laboratory science for entrance requirements.

The Civil Air Patrol, now a part of the Army Air Forces Training Command, with a membership of 80,000 cadets and 55,000 senior members, wing commands in each state, groups, squadron and flight units in more than 1,000 cities and towns, can adequately train students for flight personnel in postwar commercial aviation.

Science News Letter, October 20, 1945

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By Oscar L. Levin, M.D.
and Howard T. Behrman, M.D.

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