SCIENCE

VOL. 102 FRIDAY, AUGUST 17, 1945 No. 2642

SCIENCE: A Weekly Journal, since 1900 the official organ of the American Association for the Advancement of Science. Published by the American Association for the Advancement of Science every Friday at Lancaster, Pennsylvania.

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Communications relative to advertising should be addressed to THEO. CHRISTENSEN, Advertising Manager, Smithsonian Institution Building, Washington 25, D. C.

Communications relative to membership in the Association and to all matters of business of the Association should be addressed to the Permanent Secretary, A.A.A.S., Smithsonian Institution Building, Washington 25, D. C.

Annual subscription, $6.00 Single copies, 15 cents

THE REPORT OF PRESIDENT TRUMAN ON THE ATOMIC BOMB

SIXTEEN hours ago an American airplane dropped one bomb on Hiroshima, an important Japanese army base. That bomb had more power than 20,000 tons of TNT. It had more than 2,000 times the blast power of the British "Grand Slam," which is the largest bomb ever yet used in the history of warfare.

The Japanese began the war from the air at Pearl Harbor. They have been repaid manyfold. And the end is not yet. With this bomb we have now added a new and revolutionary increase in destruction to supplement the growing power of our armed forces. In their present form these bombs are now in production and even more powerful forms are in development.

It is an atomic bomb. It is a harnessing of the basic power of the universe. The force from which the sun draws its power has been loosed against those who brought war to the Far East.

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 war was pooled between the United States and Great Britain, and many priceless helps to our victories have come from that arrangement. Under the 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 resources 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. We now have two great plants and many lesser works devoted to the production of atomic power. Employment during peak construction numbered 125,000 and over 65,000 individuals are even now engaged in operating the plants. Many have worked there for 2½ years. Few know what they have been producing. They see great quantities of material going in and they see nothing coming out of these plants, for the physical size of the explosive charge is exceedingly small.

We have spent $2,000,000,000 on the greatest scientific gamble in history and won.

But the greatest marvel is not the size of the enterprise, its secrecy or its cost, but the achievement of scientific brains in putting together infinitely complex pieces of knowledge held by many men in different fields of science into a workable plan. And hardly less marvelous has been the capacity of industry to design, and of labor to operate, the machines and methods to do things never done before so that the brain child of many minds came forth in physical shape and performed as it was supposed to do.

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.

We are now prepared to obliterate more rapidly and completely every productive enterprise the Japanese have above ground in any city. We shall destroy their docks, their factories and their communications. Let there be no mistake; we shall completely destroy Japan's power to make war.

It was to spare the Japanese people from utter destruction that the ultimatum of July 26 was issued at Potsdam. Their leaders promptly rejected that ultimatum. If they do not now accept our terms they may expect a rain of ruin from the air, the like of which has never been seen on this earth. Behind this air attack will follow sea and land forces in such numbers and power as they have not yet seen and with the fighting skill of which they are already well aware.

The Secretary of War, who has kept in personal touch with all phases of the project, will immediately make public a statement giving further details.

His statement will give facts concerning the sites at Oak Ridge near Knoxville, Tenn., and at Richmond near Pasco, Wash., and an installation near Santa Fe, N. Mex. Although the workers at the sites have been making materials to be used in producing the greatest destructive force in history, they have not themselves been in danger beyond that of many other occupations, for the utmost care has been taken of their safety.

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 can not 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 or 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 towards the maintenance of world peace.

MICROSCOPIC AND CHEMICAL PROPERTIES OF PRECANCEROUS LESIONS[1,2]

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WHEN cells become cancerous they undergo a transformation, said to be malignant, because thereafter they and their descendants behave like criminals unrestrained by the controls which shape the behavior of their normal neighbors. We know that a great many agents, called carcinogens, can produce this change and further that there is a long interval, usually amounting to several years, between their initial action and the final transformation. A carcinogen may act once, or repeatedly, or be succeeded by another carcinogen, and modifying conditions often operate tending to facilitate or to inhibit the production of cancer. Long before the actual expression of malignant behavior by the cells it is often possible to demonstrate that these have been changed and are, therefore, far from normal.

The designation "precancerous lesion" is applied to a type of structural change in a tissue in which clinical experience shows that the cells are more likely to become malignant than in other kinds of lesions. Several types have been recognized: in the skin, pigmented moles of the junction type and senile keratotic areas; in the breast and uterus, chronic inflammatory lesions; in the colon, polypoid adenomas; and so on. But, when the fate of many individual lesions belonging to a single type is followed, it usually happens that the malignant transformation only takes place in but a few of them. The majority of the individual lesions are not in fact precancerous. The adjective "precancerous" relates to the type, not to the particular lesion. Perhaps two sorts of lesions are grouped under a single type, or they are all of one kind and some happen to be exposed to a carcinogen not acting on the majority.

Even with such outspoken lesions, some of which become malignant, it is not possible to localize the actual transformation to cells which are multiplying more rapidly or more slowly than normal; because, in a given lesion whether hypertrophic or atrophic, a few cells may not be acting like the majority which give character to it.

The problem is further complicated by our inability to discover any type of cell in the body capable of multiplication, or which can become so, which never undergoes a malignant transformation. We have to face the possibility that for each and every one of them a precancerous condition may occasionally develop which is individual and distinctive and depends on structural modifications which may or may not be demonstrable microscopically. When clinicians are confronted with lesions of a precancerous type they seldom know what caused them and they can not evaluate all the possibly modifying factors which have participated through the years in their development and persistence. It is high time that the problem be brought into the laboratory, where the precancerous type of lesion can be produced at will by a standardized technique in experimental animals and its evolution can be followed in a few weeks time. Indeed the main research project in the Barnard Hospital is analysis of the biological equation:

Chemically pure carcinogen (methylcholanthrene) + epidermis (an avascular tissue composed of cells of a single type) of closely inbred strain of mice = squamous cell carcinoma in a very high percentage of animals.

This analysis is limited to the properties of epidermis that can be quantitatively determined. Our purpose is integrative, to discover whether the properties increase, decrease or remain constant; and, when there is a change in a property, whether it is paralleled by alterations in other properties. It is, of course, not feasible to investigate many properties in one and the same group of mice. Nevertheless, by standardizing the equation through elimination of the principal variables, the observations made on properties in different lots of mice can in a sense be superimposed.

[1] From the Department of Anatomy, Washington University School of Medicine, St. Louis, Missouri, and The Barnard Free Skin and Cancer Hospital.

[2] Adam M. Muller Memorial Lecture, Long Island College of Medicine, April 23, 1945.