humans soon after the bombing was over.

Besides the heat and radiation effects, atomic bombs also produced the blast effects of the conventional types of bombs. Survivors might suffer from flash burns, blast injury and radiation injury simultaneously. In the cities and villages around Nagasaki and Hiroshima it was easy to pick out the irradiated refugees by the characteristic flash burns and frequent baldness. Of the 80,000 who died at Hiroshima and the 45,000 who died at Nagasaki it would be very difficult to say what proportion were killed by one or another type of energy.

A very striking feature of the heat injury of the A-bomb was the speed with which it acted and passed. Clothes, wisps of hair, or even the shadow of an arm across the body were enough to protect against this kind of burn, Capt. Warren reported. He showed a picture on which the profile of blades of grass stood out in relief against the burned background of a board bunker where the intense but instantaneous radiant heat burned the wood before the grass had time to wave or wither.

"The destructive effect of the blast was centrifugal except at the hypocenter (the project of the true center on the ground) where it was essentially vertical," Capt. Warren added in a brief description of the nonmedical aspects of the A-bombing effects.

"Consequently some poles and trees stood at the hypocenter, although extensively levelled elsewhere. The importance of streamlining in resisting blast was well shown by factory smoke stacks, the great majority of which stood."

Science News Letter, March 23, 1946

ELECTRONICS

Wind-Finding Equipment

Developed during the war, it provides data on conditions in the upper atmosphere. Gives speed and direction of wind. Is known as a transponder.

➤ "Wind-finding" equipment, which provided data on conditions in the upper air vitally needed by the armed services, was developed during the war by the National Bureau of Standards, it is now revealed. Initially the project involved means for increasing the usefulness of radiosonde, which automatically transmits, by radio, data on barometric pressure, humidity and temperature from different altitudes as the balloon carrying it ascends. The Navy also wanted data on the speed and direction of the wind.

The new device is known as a transponder, the Department of Commerce says, and is also called a re-emitter because it picks up signals and re-emits them back to a receiving station on the ground. In plain English, it is a two-way radio set which operates on the principle of amplitude modulation, widely used in broadcasting. Because this device requires a rather complicated antenna which swings from one position to another, it was found impracticable for installation on fighting ships because of their constant roll.

The answer to the problem was found in the "corner cube reflector" and the "pulse repeater" which operated on ships without interfering with other equipment. The corner cube reflector operates on the same principle as the reflectors commonly found in road signs throughout the country. When a radio or radar signal strikes the corner cube reflector as it revolves under the small balloon by which it is borne aloft, it is reflected back to the ground or ship station.

Fire-control radar follows the balloon, just as it follows a plane in order to provide data for aiming anti-aircraft guns. From these data the naval meteorologist is able to trace the position of the corner cube reflector as it moves through the air and to determine the direction and speed of the wind.

The pulse repeater is a small two-way unit which receives signals or pulses and repeats them in stronger volume. In addition to providing data on wind direction and speed for weather analysis, the device has a very definite application to ballistics, supplying information on wind conditions for correction of fire-control data.

The work of the National Bureau of Standards on wind-finding equipment was sponsored and financed by the Navy, which also made available to Bureau experts the Navy's modern radar laboratory on Chesapeake Bay.

Science News Letter, March 23, 1946

ENGINEERING

Internally Cooled Piston For Explosion Engines

➤ AN INGENIOUS idea for an internally cooled piston for heavy-duty explosion engines is embodied in patent 2,396,500, obtained by Walter Gasser of El Cerrito, Calif. The upper end of the hollow connecting rod is expanded into a large sphere, around which a collar-like piston fits, ball-and-socket fashion. The top of the sphere thus constitutes the piston head. Oil is forced up through the hollow connecting rod in a cooling jet against this hot surface. Rights in the patent are assigned to the Shell Development Company.

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