

rockets were fired from tubes mounted on fighter planes. Targets were Japanese supply dumps, hangars, parked aircraft, bridges, and river boats and other transports. In July the Ninth Air Force first used in combat the new 5-inch HVAR rockets, with zero rail installations, developed by the National Defense Research Committee for the Navy. Employed against locomotives, tanks, armored cars, gun emplacements, and concrete defenses from P-47's, these rockets proved extremely effective. In the Mediterranean theater P-47's firing 4 1/2-inch rockets from tubes at point-blank range have been used for ground-air operations. They have also been successful on targets of opportunity. The Tenth Air Force has recently reported from Burma that 12 launcher tubes have been mounted on B-25's and that these aircraft have been very effective against ground targets. At the present time the Army Air Forces are cooperating with the Office of the Chief of Ordnance in the development and adaptation of still more powerful rockets for use by aircraft. Far more extensive use of existing types of rockets is also anticipated during 1945.

### ***Frangible Bullets***

Not all of our weapons end up in actual combat. Recently our engineers were asked to design a bullet which could be fired at our own men. What was wanted was ammunition, which, in training, could be fired at a lightly armored plane without injuring the crew. In use, the ship would fly evasively while attacking fighters would fire these "safe" bullets at it. It took time to evolve and produce a plastic .30 caliber bullet which was frangible, that is, would break up upon contact with the target without penetrating it and which could be used on armor as light as a 1/3-inch aural plate. It is now in the final development stage and will very shortly be incorporated into our entire flexible gunnery program. The aerial gunners who are already using frangible bullets are learning to shoot far more accurately.

### ***Robot Bombs***

We do not in any way underestimate the importance of the V-1 robot bomb developed by the Germans. Shortly after they began to land in England we collected fairly undamaged parts from duds and sent them to Air Technical Service Command headquarters at Wright Field where the robot bomb was completely reconstructed. We have ordered large quantities of these bombs for test firing. Modified and improved models will soon be available for possible use, this time by the Allies.

### ***Compacs***

Based on experience gained in the invasion of Sicily and Italy, special aircraft supply compacs were worked out for the invasion of France. Each compac supplied a complete airdrome for 30 days, and was loaded into special trucks. These trucks went across with the invasion and rolled up to the airdrome where the drivers simply lifted the lids on the various boxes and went into business. Each airfield, therefore, had its own mobile warehouses. As the combat group moved forward across France, the trucks simply folded their canvas at night and drove on to set up business next morning on the new advanced airdrome.

For the invasion of small islands in the Central and Southwest

Pacific 1- and 10 day repair packups were designed and prepacked for various types of airplanes. It will be remembered that our Air Forces began landing on one end of many airfields while fighting was still going on at the other. The logistics of taking in large quantities of supplies, as well as troops and equipment by boat, made it imperative that the first landings take an absolute minimum of airplane-repair supplies. The 1-day pack-up was put ashore at the first practical moment. As soon as the airfield was secured, the 10 day pack-ups went in. The 10-day pack-up was usually sufficient to keep the airplanes assigned to that strip flying until all resistance on the island ceased and the regular stores could be brought in.

### ***Runway Surfacing***

Steel pierced-plank has continued to perform outstandingly in all theaters of operation. Production of this type of runway surfacing totals 662,000,000 square feet to date, a quantity sufficient to surface a 4-lane motor highway from New York to San Francisco. During 1944, 589,000,000 square feet have been shipped overseas. This quantity would be sufficient to surface-785 runways 150 by 5,000 feet in size.

In anticipation of airborne operations, aluminum pierced-plank has been developed under the direction of the Air Engineer during the past year, the first overseas shipment being in September. Requirements from the theaters for aluminum mat, for this year and next, already total 18,000,000 square feet, or enough to surface ten B-29 runways. The 45,000,000 pounds of aluminum needed for these mats is equal to one-seventh of the entire United States production of aluminum in 1939. The aluminum-pierced plank was developed to permit transportation by air to advance airfield sites. Due to the lighter weight, an aluminum mat can be laid in approximately one-half the time required for steel. Results of tests indicate that the aluminum mat is comparable to the standard steel mat, if not superior.

### ***Testing of Material***

Experience in all branches of the military service has demonstrated many times that only when there exists an agency to represent the using organizations will there be adequate, realistic testing of materiel. The highly specialized qualities of aircraft make such an agency doubly important; we must assume as a matter of course that the proper use of developments comes from the closest of coordination between AAF men in the field and AAF men in research. Thus for some years there has been established in northwest Florida the Proving Ground Command, whose functions have proved of aid to our fighting wings.

The work of this command is indicated in this example: A very complete series of tests has been conducted on the B-29 Superfortress. From a technical point of view, all of these B-29 tests are of interest, but from the point of view of practical effect on the war effort, it is believed the most important are those relating to the investigation of the radius of action of this powerful weapon under combat conditions.

Prior to any operation of B-29 airplanes against the Japanese, A-3 of the Twentieth Air Force surveyed the targets that were believed to be in range of the available bases in China. Insufficient range data on the B-29 made it difficult to determine which targets could be attacked, since most of the targets were in Japan proper.