attention of chaplains, company officers, instructors, military police, Red Cross and U.S.O. workers, and other special personnel," Dr. Stevenson said. "Heretofore, there has been little that could be done about the man who sits disconsolately in the U.S.O. hut, taking no advantage of its reading or recreational facilities; or about the man who in spite of exceptional intelligence cannot absorb the training; or the man who drowns his troubles in liquor, or goes A.W.O.L.

"These troubled individuals can now be given help in a mental health unit, if one exists in his camp, and it is significant to note that nearly one-quarter of all the men seen have sought such guidance spontaneously."

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RADIO

Radio Is at War

More than 500 factories and small shops are turning out equipment for the armed services. New specifications call for perfect performance.

➤ MORE THAN 500 factories and small shops, that used to make radio sets and equipment for civilian use, now have some 200,000 employes working day and night turning out communications equipment for the armed forces of America and her fighting allies, Rear Admiral Stanford C. Hooper, U.S.N., told the meeting of the Institute of Radio Engineers.

As a single dramatic example of what quick radio communication means in modern warfare, Admiral Hooper related an incident of the fighting during landing operations at Casablanca. The most formidable French warship putting up resistance was the battleship Jean Bart. An Allied battleship opened fire on her, at a range of 26 miles.

The first salvo scored a hit on her deck, a damaging but not a fatal blow. An observation plane flashed back a slight correction. The next salvo struck the ship at the waterline, immediately putting her out of action.

For military uses, radios must have qualities far beyond the very moderate requirements of peacetime sets, the Admiral reminded his hearers. He said:

"These new specifications reflect the demand for perfect performance; perfect reception by planes flying at twenty thousand feet, battling ice and sleet, as well as the enemy; perfect reception by pitching tanks, hurdling debris and jolting through shell holes in the heat of the African deserts; perfect reception for all our mobile equipment, whether it be in the Battle of Midway, the Aleutians, or the green hell of steaming jungles in the Solomons.

"These specifications call for equipment that must stand up with full efficiency under all conditions—tropical and Arctic temperatures, rapid changes in altitude, varying humidities, salt spray, hot sun and desert sands. It must be unaffected by the motion of motorized units, ships and aircraft, and the jar and vibration due to gunfire and shell impact. It must be fireproof, especially from the instantaneous hot flame which follows a bomb explosion or proximity to hot metal surfaces. It must carry on during severe icing and snow conditions. It must be rugged to withstand mishandling and operation by inexperienced personnel, and jars due to handling in transit. It must be designed to compromise ruggedness and extreme sensitivity.

"It must be capable of being operated adjacent to various other transmitters and receivers through the roar of battle, through electrical and other noises of ships and planes, and radio jamming. The radiation from tubes must not divulge presence to an enemy. It must be flexible in frequency shifting and power variation in order that shifts from one command or information channel to any other may be accomplished as required, and instantaneously.

"It must be constructed for installation in most limited spaces, with minimum weights, and convenient for operation. It must be instantaneously ready for operation at all times, exactly on the prescribed frequency, and accessible for adjustment and quick repair. Danger of accident due to electric shock to personnel must be prevented. These are but a few examples to show the need of specifications more elaborate than those governing design of commercial equipment."

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ASTRONOMY

Victory Ship Named for Designer of Telescopes

➤ A NOTED American astronomer, designer of the 100-inch telescope at the Mt. Wilson observatory and projector of the huge 200-inch reflector now being built for the new observatory on Mt. Palomar, was commemorated in the launching of the Victory ship George E. Hale, just off the ways of the California Shipbuilding Corporation. Dr. Hale's widow, Mrs. George E. Hale of Pasadena, was sponsor of the new vessel.

Dr. Hale died at Pasadena in 1938, at the age of 70 years. Besides planning the most massive instruments ever built for the exploration of the heavens, he carried on researches in solar physics and stellar evolution, and was the inventor of the spectroheliograph, which makes photographs of the sun in the light of a single selected element. He shares the latter honor with a French astronomer, Deslandres.

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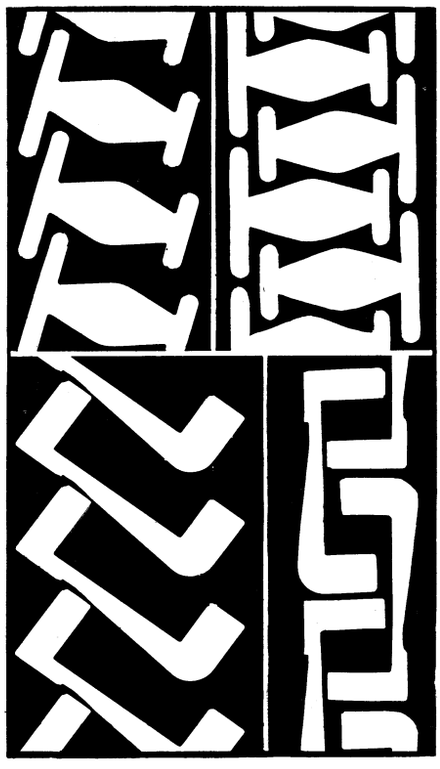

SAVING—The layouts shown here show how precious metal is being saved in cutting pieces for war production. At the left is the way the patterns have been laid down when metal was more plentiful. At the right are economy layouts worked out by a General Electric Company expert.

PLANNING—Working out a war-essential sort of jig-saw puzzle, J. C. Smith, General Electric Company planner, arranges a layout with paper pieces to insure minimum waste when the patterns are later cut from steel.

ENGINEERING

Power From Tests

More than half the power needed to operate an engine factory can be obtained from energy formerly wasted by plane engines on test block.

➤ MORE THAN half the power needed to operate an engine factory can be recovered from tests of plane engines, G. E. Cassidy, W. A. Mosteller and W. L. Wright of the General Electric Company reported to the American Institute of Electrical Engineers meeting in New York.

The power-recovery method has helped the war effort by giving to the aircraft engine industry a testing technique that contains advantages not available in other methods, the engineers pointed out. Testing can be made with greater ease and in less time on a basis that is economically sound.

Previous to the development of the new power-recovery system, energy produced during testing was dissipated by water brakes, propellers, electric brakes and other devices which involved complete wastage. Fuel consumed accomplished no useful purpose other than testing of the engine. Furthermore, engines became so huge that schemes to dispose of the power by wastage began to present difficult problems.

Starting with an inquiry for an improved method from Pratt and Whitney Aircraft, development of the power recovery system has gone through several phases.

Using an induction generator, one of the latest setups begins the test with a cold start and run-in test for checking mechanical operation and lubrication of the engine. Then speed is gradually increased. When ready to "fire" the ignition switch is turned on and the engine throttle adjusted to idling speed. As the throttle is opened, the generator speed passes through synchronism and load is automatically applied to the engine. Any desired values of load and speed can be established.

From such a test, the engineers reported that 3,000 to 6,000 kilowatt-hours of energy may be recovered from each engine of current-large rating.

"The advantages of the power-recovery system applied to the testing of aircraft engines have not yet had time to be universally appreciated," the engineers maintained.

"It may be quite possible that with the passing of time the engine builder will point with more and more favor (toward wider use of the method) because he is already pointing toward larger aircraft engines—and the larger the engine the more advantageous power-recovery testing becomes."

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PUBLIC HEALTH

Meningitis Increases Almost 20% in Week

➤ CASES OF meningitis throughout the nation increased almost 20% during the week ending Jan. 23, latest for which figures are available. Reports from state health officers to the U. S. Public Health Service show 354 cases for the past week as compared with 298 for the week of Jan. 16. Most of the cases are on the East and West coasts.

Total number of cases for the year to date, that is, to Jan. 23, is 941, which is probably the largest number for that short a period since the U. S. Public Health Service has been keeping weekly records of this disease.

Influenza cases totalled 4,387 for the week of Jan. 23, about the same as for the previous week. Measles increased slightly.

There were 23 cases of smallpox, five in Ohio and four in Indiana. No other state reported more than two.

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ENGINEERING

Infrared Lamps Dry Painted Plastic Helmets

See Front Cover

➤ PLASTIC helmet liners weighing only 12 ounces are said to be as strong as steel of the same weight. They give our soldiers adequate protection during non-combat duty and comfort under the steel helmets during battle.

The photograph on the front cover of this week's SCIENCE NEWS LETTER shows freshly painted hats of war going under the drying rays of infrared lamps in a Westinghouse Electric and Manufacturing Company plant.

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The *pecan,* America's most valuable native nut tree, yields over 60,000,000 pounds of nuts annually.

Aircraft used in desert country are fitted with a special *filter* to keep out as much of the sand as possible.