PSYCHOLOGY

Seeing in the Dark

Navy lookouts are given special training with ship models displayed on dimly lighted stage to enable them to get the first look at the enemy.

By MARJORIE VAN de WATER

See Front Cover

➤ THE BLACKED-OUT darkness of a wartime sea has made the job of Navy lookout much more difficult and extremely more important.

To sight the vague shadowy blob on the horizon that is a distant enemy warship. To spy the tiny dot that is a deadly submarine periscope. And to recognize these danger signals swiftly before the enemy has a chance to strike. This is the job of Navy lookout. On him depends the safety of the ship—the safety of the nation.

Death strikes swiftly in modern naval war. And it strikes at great distances. In five seconds—less time than it takes for the lookout to blow his nose—the deadly torpedo can be launched, destruction is already on the way. No time for a second glance to make sure. No time to think it over.

To train men how to use their eyes in the black of moonless nights and to make these split-second observations, the Navy has developed a new device—a stage where the lighting effects are duplications of the faint starlight, glowing dawn, swift lightning, the faint red glare of a fire at sea, or the careless diffused light backdrop of a badly dimmed-out coast.

Accurate Models

The "principals" of the drama on this new kind of stage-with-a-purpose are precision-accurate models of the lumpy looking Japanese warships and the sleek business-like vessels of the Nazis.

The lookout in training winds his way through a passage of light baffles which insure complete darkness within the training room. He sits on one of a series of benches. Before him is the stage —a length of horizon, dark sky above dark water.

It is not so long as you would see were you walking the deck of a steamer That is because the Navy lookout doesn't have to watch the whole sea. He is charged with responsibility for one particular area which he must scan, letting his eyes rest for a brief interval at point after point, systematically covering the area.

While he sits in the blackness, letting his eyes grow used to the dark, an instructor tells the lookout about the way his eyes work at night. He learns that night vision uses a different set of nerve cells called the rod cells and that these are placed around the outer part of the eye's retina instead of in the center as are the daytime cone cells.

For this reason, night eyes are blind in the exact center of the eye—the very place that is the best for seeing things in the daytime. In the night, therefore, it is necessary to break the habits of a lifetime and look somewhat away from what you want to see—not directly at it. You must look a little above, a little below or to the right or left. When you look straight at the vessel you have spotted, it will disappear like a ghost ship.

Night eyes, he learns, are color blind. Nothing counts at night except the delicate differences in shades of black or gray by which you can tell the solid form of a ship from the sky beyond it.

Night eyes do not see clearly and sharply as do day eyes. Vague, blurry outlines are all that you can make out. You must be able to tell, without seeing any more than that, what sort of object is in the sea and whether it is friend or foe.

Can't See Colors

Night eyes are very much more sensitive to faint light than are day eyes—thousands of times. After sitting in the darkness for 20 to 30 minutes, or with eyes protected by the Navy's new red goggles, the lookout is using his night eyes. The rod cells have taken over the job of seeing for him.

But even the sensitive rods are incapable of seeing anything in the complete darkness of the training room. City dwellers have never seen such utter blackness, unless it is in a photographic darkroom.

But now the dawn breaks on the stage. It does not come up like thunder. Some eyes cannot see it at all. I couldn't. Well, I did think I could barely make out traces of a difference between sky and sea, but I was not even sure of that.

Men differ greatly in night vision. There are men who can see in that faintly reduced darkness. They can spot ships with no more light than that. These are the men who make best lookouts. And Navy men know that some Japs have that kind of night vision, too —and some Germans.

A little more light and I could begin to see. Yes, there was definitely a horizon now. As I looked toward the center of the stage, I thought I could make out a vague blur off to the right. But when I turned my eyes that way there was nothing. I could see it only with the tail of my eye, and then so faintly that I couldn't be sure.

Some See More

Yet that sort of vague impression is often all that a lookout ever sees of a submarine or a plane or a warship before the torpedo or the bomb is launched. Some men can see much more at this illumination. They can not only tell you from which direction a ship is approaching, they can tell that it is battleship, cruiser or destroyer.

But if your eyes are not adapted to the darkness, you see much less. Even a brief look at an instrument by a bright flashlight will spoil night vision so that the enemy cannot be seen at all.

Now the dawn is really coming. It is still black in the room. You can't see your own hands held before your face. But the eastern horizon has enough faint glow so that you can see, to your surprise, that there is not just one ship, but a whole convoy sailing along.

All you need now is the smell of salt air and the throb of engines and the swell of the sea beneath your feet to complete the effect. There is the enemy! And in force! But then you are sobered by the thought that if you had not seen him long before this, he would have seen you!

Nature has her bag of dramatic lighting effects, you learn in this training room. Maybe you have never conquered a childhood fear of the crackle and bright flash of lightning, especially lightning at sea. But if you are a Navy look-

out, you will. For a stroke of lightning, instantaneous though it is, gives you a sudden glimpse of all the details in your lookout area, flooded with all the light of day. In that split second, you can see masts and guns and other details imperceptible before. You can see colors. You can see the bright reflection of light on shiny surfaces.

And war brings its own strange lighting. Off to the left of the horizon there is the ruby glare of a fire at sea. That means tragedy for us or for the enemy. It means also a new strange light in which to try to see our own hazards. And we know that the burning ship is not alone, for now comes the bright flash of gunfire.

Gunfire is not like lightning. It does not light up the whole scene. It will not help in seeing a ship unless the flash is behind it and shows it up in silhouette. But it may blind us if we are looking straight at it. So bright a light will spoil the vision of the sensitive rod cells.

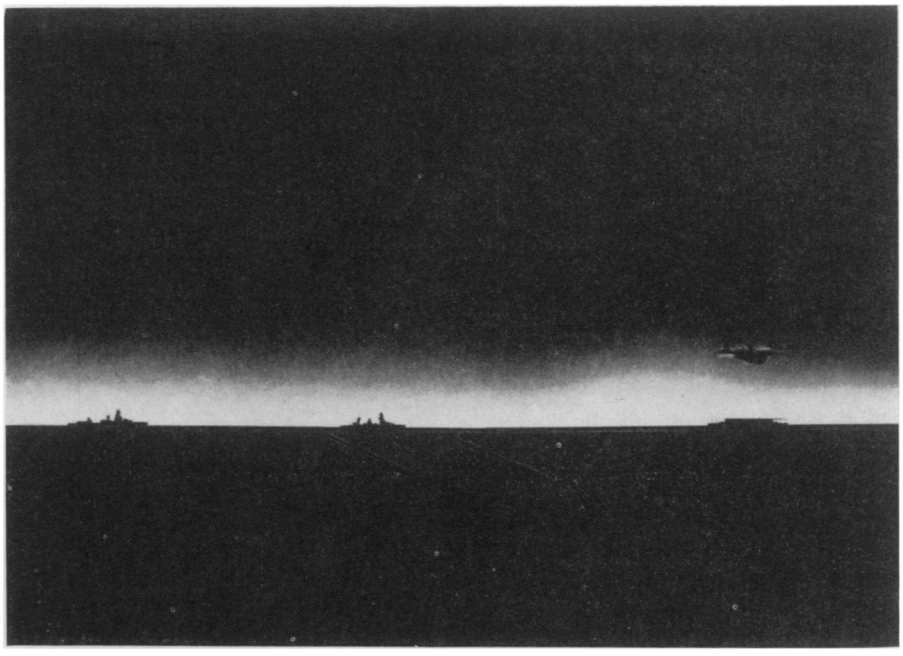
Training Helps

Although men's eyes seem to differ in sensitiveness to the faint light of the night sky, it is possible for individuals to improve greatly in the way they use their eyes—in their ability to see with the visual equipment they have.

It often means breaking habits that are thoroughly ingrained. In the daytime, the best part of the eye for seeing is right in the center. Without thinking, we turn our heads or our eyes to look directly at what we want to see well. That is the best way to see clearly with the cone cells. At night this part of the eye is blind, and we must look away from an object in order to see it at all. It is hard to go contrary to our habits to do this. It takes long and patient practice.

In the daytime we want to take a good look at a thing and see its details clearly before we try to recognize it. In the night, we never see detail clearly. It is necessary to recognize objects on the basis of a general impression, a hazy sort of overall perception in which all details are lost—blocked out. This, again, is contrary to the habits of a lifetime. It takes practice.

The value of such practice is shown in a dramatic way. One man had had an illness that caused a hemorrhage in one of his eyes as a result of which the center of that eye was completely blind. With that eye he was unable to see anything he looked at directly—a disability for daytime seeing. But when he came to take the training for seeing at night, it was found that his vision was much better in his "bad" eye. With that eye he had learned the trick of looking away to see things.



LOOKOUT TRAINING—In modern naval warfare, the lookout who gets the first glimpse of the enemy is on the ship with the best chance of survival. In a special program of training, U. S. Navy lookouts learn to identify enemy ships at night or in the uncertain light of early dawn by studying models on a special dimly illuminated stage. This photograph and the one on the front cover are official Navy photographs.

The Navy's new night vision training stages are not the only places where training in night vision could be given. At New York, Philadelphia, Chicago and Los Angeles are buildings called

planetariums where special projectors can reproduce the stars of the night skies at any time or season. These were originally intended to give the public a chance to study the stars. Now plans have been made to use them also to teach men in the armed services how to see at night and how to plot a course by the stars.

If you are a volunteer airplane spotter or night air raid warden and you live within easy traveling distance from one of these planetariums, you may be able to arrange to get this sort of training.

The planetarium is used in much the same way as the lookout training stage of the Navy. In the room lighted only by the "stars" you learn to see and recognize ships or airplanes, or the water tanks and towers of a landscape with the "tail of your eye."

The Canadian Army has developed another method, using silhouettes projected on a screen.

Of course none of these training devices are as good as is the open, unlighted sky of night. But unfortunately (or fortunately) opportunities to practice seeing the enemy under perfectly natural conditions are limited. As the instructors tell the lookouts under training:

"You may never in your whole life see but one enemy submarine."

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PSYCHIATRY

Defends Army Psychiatry

Feeling that they are not "at end of the road" helps patients to improve. Also contributing to their improvement is continued contact with world and duty.

➤ CRITICISMS of the Army disposition of soldier mental patients by getting them out of the service as quickly as possible are combatted by Lieut. Col. William C. Porter, Capt. John G. Novak and Lieut. Paul V. Lemkau, all of the U. S. Army Medical Corps (*Military Surgeon,* April).

Because it is frequently impossible ever to restore the mentally ill soldier to combat duty, it is the duty of the psychiatrist to rid the Army of the dead weight of the casualty and to do this as rapidly as possible, these Army physicians explain. Criticisms of this Army attitude, they say, are based on the assumption that the patient is habitually neglected during the three to six months usually required to dispose of a psychiatric casualty.

This assumption, the psychiatrists say is "equivalent to saying that a medical officer would allow a wounded soldier to die because he had had a leg injured so severely that he would never again be able to march. The therapeutic interest of the psychiatrist is as great in most instances as it would be if he were trying to save the life of the hero of a battle who had unfortunately sustained an irreparable wound."

Actually, the feeling that they will not remain long in the Army psychiatric ward but will soon either be returned to duty or sent back to civilian life, is a factor contributing to the improvement of the patients, the Army physicians indicated. The patients realize that they are not at the end of the road. They know that permanent hospitalization in the Army is impossible.

Another beneficial aspect of the Army psychiatric treatment is the fact that the patient is not declared legally irresponsible. He is called upon regularly to sign the pay roll and to endorse his pay checks, though his money is held for him by responsible officers. This money cannot be spent without the patient's written consent in the form of his signature on a request that the check be drawn and then an endorsement on the check itself. He is allowed and encouraged to send reasonable amounts home to his dependents. This keeps him in active touch with real life.

He is also kept linked with the world of normal people by his Army uniform. This is not his regular duty uniform, but it is a standard uniform worn by all patients whether they have been wounded in battle or are mentally or physically ill.

The mentally ill soldier is expected to follow the usual military courtesies that he has been trained to observe before his illness. This has proved helpful to the patients.

"It is a frequent observation that well trained soldiers, when they become psychotic," the report states, "are, in general, less disturbed than are recruits. Self-discipline takes the place of the restraining sheet in the military hospital and military discipline lends its aid to self-discipline in this relatively non-personal way."

The soldier patient has the benefit of early hospitalization, for any sort of bizarre or unusual behavior is immediately noticeable in Army life although it might escape notice or treatment for long periods in civilian life.

The medical officer in charge of soldier mental patients has double responsibility, the report explains. First, he is an officer in the Army and must discharge his duty to the military establishment and devote himself primarily to the needs of the combat arms. For this reason he must often prevent the soldier who has broken under the strain of combat from going back into full service—frequently a great blow to the patient. Secondly, he is the therapist, anxious to see his patients improve and recover.

But the patients generally grasp the significance of this dual role very clearly, the report states.

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ENGINEERING

Low-Cost Method Speeds Discovery of Defects

➤ EXAMINING light alloy castings by fluoroscopy saves time and expense. X-rays throw an image on a fluorescent screen but no photograph is taken just as many shoe stores do to fit your foot correctly.

British experience with the method and development by the Robert Mitchell Co. was reported by the firm's metallurgist, A. E. Cartwright of Montreal, Canada, to the American Foundrymen's Association meeting in St. Louis.

Although the new method is not as sensitive as the usual X-ray photograph procedure, it is practical for speedy, low-cost examination of the increasing war volume of many low-stressed aircraft and industrial castings.

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