

Night Vision



The tip came in late on Christmas Eve. Members of the Al-Qaeda terrorist network had executed a man in public, and then retreated to a house in a residential neighborhood in Mosul, Iraq.

It took the Army Rangers a few hours to prepare. They pulled on their dark-colored uniforms for night operations, packed their belts and jackets with magazines of ammunition for their M-4 rifles. Finally they placed their thermal imaging night vision goggles atop their heads. They were ready for battle.

At 2:04 a.m., 18 Rangers arrived at the house. They pulled their night vision goggles down over their eyes, and prepared to enter.

"You don't go into anything thinking about the best-case scenario," says Pete, 26, a Ranger from Marlboro, N.J. who was part of the squad. Army rules bar members of Special Forces units from providing their last names. "Anytime you go through a door, you're expecting someone there with a gun waiting on you. Or someone with a suicide vest, grenade, or whatever their weapon of choice is at that particular time. You're always thinking for the worst."

Pete and another ranger slipped into the house. Immediately they were confronted by two gunmen. The insurgent pushed an 11-year-old boy in front of them as a human shield. The insurgents raised their weapons and searched for the Rangers through the dark rooms of the house.

The gunmen could not see the Rangers, but the Rangers knew precisely where the gunmen stood. Through their goggles they saw them, two tall figures cowering behind a shorter one. The warmest parts of the insurgents' bodies, including their eyes, ears and mouths, were illuminated more brightly than the rest. Coldest were their guns, which stood out in the goggles as dark shapes of cold metal.

The human eye can detect only a very narrow range of visible radiation, which we see as light bouncing off objects. The full electromagnetic spectrum is much broader than that. On one end are protons and gamma rays, with very high frequencies, and at the other end are radio waves with very low frequencies. The range of frequencies just a tad smaller than what the human eye can see is called infrared, and the primary source of infrared radiation is heat. Different objects emanate different levels of heat, which correspond to different infrared radiations. Humans radiate heat at a wavelength of about 10 microns. (One micron equals one millionth of a meter.)

A pair of thermal imaging night vision goggles uses this natural heat radiation to help people see in the dark. A special lens is used to capture all the infrared radiation being emitted by all the people and things in view. Those radiation readings are used to build a picture of the scene called a thermogram. A computer fills this thermogram with colors. Different systems use different shades, but generally hotter areas—the ones radiating more heat into the cooler air—appear brighter than cold ones. This image is then displayed on a lens the soldier straps in front of his eyes.

The point is not simply to see at night, but to see with accuracy. Early that Christmas morning in Mosul, the Army Rangers' goggles performed perfectly. Even though the adult insurgents were hiding in the dark behind a boy, Pete raised his rifle and shot them both. The boy escaped unharmed.

That might have been the end of the firefight. The soldiers found 10 women and children huddled in the back of the house. But the Iraqis gave conflicting accounts of how many others were also in the house.

That made the Rangers suspicious. They searched the house. Lashaun, a sergeant first class from Chester, Virginia, was inspecting a bathroom on the first floor when he noticed a nylon strap sticking out from under the shower basin.

"That's when I called in Pete and told him to help hold security on the shower basin as I pulled the strap out of the floor," Lashaun said. "That's when the basin came up and revealed a hidden passageway to a hidden bunker."

After pulling up the bottom of the shower, Lashaun rolled aside a concrete block that was perched on rails. He found a small hole in the floor. Immediately, gunfire rang out from the hole. Pete and Lashaun fired their weapons back into the hole and retreated out of the room. Pete threw a grenade down the hole, and then the Rangers moved back into the bathroom.

Through their infrared goggles, the soldiers saw multiple grenades flying from the hole and into the bathroom. Lashaun and Pete dove out of the room for cover. After the grenades exploded, the insurgents leapt from the hole and opened fire, launching a barrage of shells.

But while the insurgents were shooting blind, their white-hot gun muzzles pinpointed their exact locations for the night vision-equipped Rangers. The soldiers returned fire, killing a number of insurgents.

"After that we came to the conclusion that we need to get out of the house," Lashaun said.

When the soldiers retreated their company commander, Blake, called in an airstrike. An AC-130 gunship, shaped like a fat pickle with wings, flew over the house at 3:05 a.m. Members of its crew fired five 105-milimeter cannon rounds at the house. Because each shell had a delayed fuse, it penetrated the roof before exploding on the ground floor, near the bunker.

In the end, the U.S. soldiers killed 10 insurgents, including the leader of an assassination cell. None of the Army Rangers were killed. Even with warplanes, satellite-guided bombs, and other sophisticated weapons at their disposal, military leaders credit thermal imaging goggles as the best tool they have on the battlefield. As Barry McCaffery, former general and commander of the Army's 24th Infantry Division put it, "Our night vision capability provided the single greatest mismatch of the war."

Name: _____ Date: _____

1. What allowed the Army Rangers to see in the dark?
 - A M-4 rifles that had special lenses
 - B eyeglasses with special lenses
 - C thermal imaging night vision goggles
 - D high-powered flashlights

2. The Army Rangers wore thermal imaging night vision goggles. What effect did this have on the Army Rangers' ability to fight the insurgents early that Christmas morning in Mosul?
 - A They were able to see the insurgents hidden in the bunker but not the ones in the dark rooms of the house, resulting in the death of the Rangers.
 - B They were able to see the insurgents hidden in the house at night and kill 10 insurgents.
 - C They made it more difficult to see and fight the insurgents hidden in the house at night but easier to see and fight them during the daytime.
 - D They were able to see the insurgents hidden in the house, but the insurgents still got away.

3. The thermal imaging night vision goggles are one of the best tools American soldiers have on the battlefield. What evidence from the text supports this conclusion?
 - A The goggles gave the Army Rangers an advantage over the insurgents because the Rangers could pinpoint the insurgents' exact locations in the dark.
 - B American soldiers also use sophisticated weapons such as warplanes and satellite-guided bombs.
 - C The human eye can detect only a very narrow range of visible radiation, which we see as light bouncing off objects.
 - D The goggles have special lenses used to capture all the infrared radiation being emitted by all the people and things in view.

4. What can be concluded about the tools the insurgents used to fight the Army Rangers?
 - A The insurgents did not have any weapons with which to fight the Army Rangers.
 - B The insurgents also had thermal imaging night vision goggles.
 - C The insurgents used weapons the Army Rangers did not have.
 - D The insurgents did not have thermal imaging night vision goggles.

5. What is the main idea of this passage?

- A American military forces must not depend on the information Iraqis give during battles with insurgents.
- B American military forces do not have the weapons they need to fight their enemies in the battlefield.
- C American military forces use tools, such as thermal imaging night vision goggles, on the battlefield that give them an advantage over their enemies.
- D American military forces must fight their enemies at night when their enemies are not able to see them.

6. Why does the author use quotations from the Army Rangers throughout the passage?

- A to show that the Army Rangers had different accounts of the same events described in the passage
- B to show the Army Rangers' perspectives of the events described in the passage
- C to show that the Army Rangers helped write the passage
- D to show that the Army Rangers are the only ones who can give an accurate account of what happened

7. Choose the answer that best completes the sentence below.

The insurgents in the house could not see the Rangers, _____ the Rangers knew exactly where the insurgents were located in the dark.

- A but
- B because
- C so
- D if

8. What did the Rangers do when they became suspicious about the conflicting accounts Iraqis gave of how many people were in the house?

9. What did the Army Rangers' commander, Blake, do when the Army Rangers retreated from the house?

10. The thermal imaging night vision goggles helped the Army Rangers kill the insurgents early that Christmas morning in Mosul.

Explain what other factors contributed to the success of this mission. Use evidence from the text to support your answer.
