NATIONAL ARMY MUSEUM

Operation Science: Body Armour

Transcript

(Emily is stood in front of uniforms in a glass case in Battle Gallery.)

Hello, my name's Emily and I'm the Learning Producer here at the National Army Museum. Today, we are going to be going behind the scenes in the Museum to discover more about an unusual object from the First World War here in our collections. The First World War took place from 1914 to 1918, over 100 hundred years ago and we tend to think of this as one of the first conflicts to use modern technologies. This massive conflict led to the invention of many technologies that we still use today. For example, X-ray machines, submarines and even the trench coat.

During the First World War, the British Army wore a uniform of khaki, which helped them to blend in with their environment in the trenches. However, the soft caps did not offer much protection from shrapnel and bullets. What else do you think a soldier could have worn to protect themselves?

(Emily is stood behind table which displays a Dayfield Body Shield. She is in the museum stores)

Although metal helmets had been issued to most British troops by 1916, newspapers and magazines back home often carried adverts for other protective items that you could purchase and send to your loved ones at the front. I'm here in our museum stores to discover an unusual object in our collection. This is the Dayfield Body Shield. It's metal plates covered in fabric and it was designed to be worn underneath a uniform during the First World War. Now, when I think of armour, I tend to think of those big metal suits worn by knights hundreds of years ago. To me, this looks a bit like a chunky padded waistcoat or even an old-fashioned life jacket. Do you think it would do a good job at protecting you?

The Dayfield Body Shield weighs around 4lbs, which is roughly the same as about 580 tea bags. Now, I know this doesn't sound like a lot, but you have to remember you'd be wearing this underneath your uniform, with the rest of your kit - so it would start to weigh you down. Also, the metal plates would make it quite difficult for you to move and that's not what you want in the middle of a battle.

(Image of Chemico Body Armour on Screen, with a voiceover from Emily)

We also have something here in the Museum called 'Chemico' Body Armour, which is also from the First World War. It's made of layers of silk and fabric which have been squished together. The idea being that these tightly packed layers would absorb the impact of a bullet travelling at 91 metres per second. This sounds pretty effective, right? However, we have to remember that the trenches could be quite cold, damp and wet places, especially during the winter, Because the armour was soft, it became useless when it got wet and ended up being very heavy to wear.

(Emily is stood in front of a camouflage background, wearing goggles)

The whole point of body armour is to protect you from stress and in science, stress means a force that is applied to an object, so for example a bullet hitting the body armour.

Now, in this tub I have something called Oobleck, okay, which is a mixture of corn starch and also of water. So, you could have a go at making this at home. And Oobleck is a non-Newtonian fluid, which means it changes its state under stress. So, for example, when I hit it really hard, it acts like a solid, but when I touch it slowly and gently, it acts like a liquid. The way non-Newtonian fluids like Oobleck change, means that they could work really well to create body armour, altering their state under stress.

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(Emily is stood in front of a display case in Battle Gallery, containing a D30 kneepad)

Some non-Newtonian fluids, like D30, have actually been used in modern-day protective equipment. Here, in our Battle gallery, we have a D30 kneepad worn by soldiers in Afghanistan. Now D30, a non-Newtonian fluid, works really well as this kneepad because it's soft and flexible to wear, but it hardens up to protect you on impact.

(Emily is stood in front of uniforms in a glass case in Battle Gallery)

Today, we've explored an unusual object in our collection and got our science heads on to discover just how it works. You can find more of our family activities over on our website. Hope to see you in the Museum sometime soon!

(Video ends)

Images from the National Army Museum Collection used in this video

- The South Staffordshire Regiment in the trenches at Wulverghem, Belgium, 1915
  https://collection.nam.ac.uk/detail.php?acc=1986-06-77-46

- 'Chemico' body armour belonging to Corporal Sidney W Cooper, 2nd/6th North Staffordshire (Princess of Wales's) Regiment, 1915
  https://collection.nam.ac.uk/detail.php?acc=1983-07-93-1