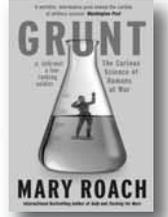


# *Grunt: the curious science of humans at war*

by Mary Roach

Oneworld: London; 2016; 288 pp.; ISBN 9781780749778 (paperback); RRP \$27.99



In *Grunt*, best-selling author Mary Roach explores not guns or weaponry or fighting, but tackles the science behind some of a soldier's most challenging adversaries – panic, exhaustion, heat, noise – and introduces us to the scientists who seek to conquer them. *Grunt* is a collection of stories about keeping human beings intact, awake, sane, uninfected, and uninfested in the bizarre and extreme circumstances of war. It is drroll, often deeply strange and sometimes rather disturbing.

Roach dodges hostile fire with the United States Marine Corps Paintball Team as part of a study on hearing loss and survivability in combat. She visits the fashion design studio of United States Army Natick Labs and learns why a zipper is a problem for a sniper. She visits a repurposed movie studio where amputee actors help prepare Marine Corps medics for the shock and gore of combat wounds. At Camp Lemonier, Djibouti, in east Africa, we learn how diarrhoea can be a threat to national security. Roach samples caffeinated meat, sniffs an archival sample of a World War II stink bomb, and stays up all night with the crew tending the missiles on the nuclear submarine USS *Tennessee*.

Setting about her task with infectious enthusiasm, the incomparable Roach learns about everything from life-changing medical procedures such as testicular transplants to more esoteric innovations like firing dead chickens at fighter jets. At a military lab in Massachusetts, for instance, everything a soldier wears, eats, sleeps on or lives in is developed or tested. This includes self-heating parkas, concealable armour, synthetic goose down and restructured steaks. Also, if you are a priest, extended-shelf-life communion wafers. And a sandwich that keeps for three years.

Roach meets Peggy, the flame goddess who tests new fabrics at the highest temperatures. With protective clothing,

there's always a trade-off. Polyester is strong, cheap and does not ignite, but it melts. "What you don't want to be wearing inside a burning army tank is polyester tights." The current Flame Resistant Army Combat Uniform (FRACU, pronounced 'frack you') is made of something called Defender M, which balloons away from the body as it burns, but tears easily. They are still working on it.

Roach visits Florida where scientists try to counter heat-stroke. You can sweat up to 2kg an hour in combat, and up to 10kg of water in a day. There are about 3500 cases of heat illness among active United States Armed Forces personnel every year. "Fainting is both symptom and cure ... heatstroke, however, can kill." Going shirtless in the sun, it turns out, makes you hotter, not cooler. "You can imagine how heat illness experts feel about sunbathing: people who willingly lie in direct sun, on hot sand, nearly nude." Elsewhere, she discusses the importance of earplugs, which reduce noise by some 320 decibels, essential in the deafening theatre of modern warfare; and the danger of earplugs, which is that when you wear them, you cannot hear anything.

Mary Roach is the *New York Times* bestselling, comically-inclined author of several popular science books including *Gulp*, *Bonk*, *Spook* and *Stiff*. She has written for the *Guardian*, *Wired*, *BBC Focus*, *GQ* and *Vogue*.

The sheer profusion of 'fun facts' makes *Grunt* worthwhile: body-building has become the number-one pastime on bases in Afghanistan; maggots breathe through their bottoms; rabbit poo costs more than rabbits – \$35 a gallon is not unknown. All life is here. Engrossing, insightful and laugh-out-loud funny, *Grunt* is a fascinating ride to the wilder shores of modern military life.

**Marcus Fielding**