

# HORRIBLE SCIENCE



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Horrible  
Books!

AWARD-  
WINNING  
SERIES



## YOUR BATTLING BODY

Fancy a fight? Well, your body does. Every day it's spoiling for a fight — with germs! And here, as promised, is a unique glimpse of those top-secret military battle plans...

**TOP SECRET DOCUMENT**

**KEEP OUT OF  
REACH OF  
MICROBES!**

The Human Body Defence Plan

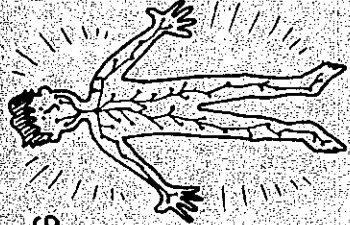
BY MAJOR  
GERM-BEATER



The body's defence mechanism, or "immune system" as we insiders call it, is based on phased defence and counter-attacks... so stand to attention for this important briefing!

### MILITARY BASES AND ROADS

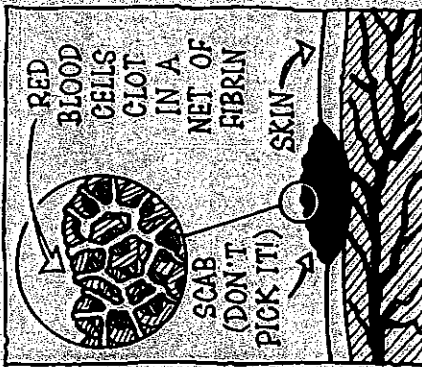
The defence system is based on military roads called the lymphatic (lim-fat-tic) system, complete with army checkpoints called lymph nodes, or "glands", where white blood cells re-group to fight infection.



## LINES OF DEFENCE

**1 Skin barrier**  
I'd like to see the germ who can burrow through this thick leathery wall!

Trouble is, humans do insist on scraping or cutting their skin and allowing germs in.



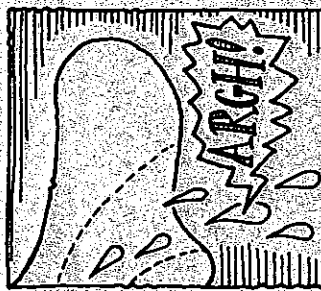
## 2 The snot barrier

Known to us defence professionals as "mucus". The sticky snot of the nose or windpipe or guts bogs down attackers and contains a substance that kills some germs. Our front-line troops deployed here are the mast cells.

They're under orders to release a chemical

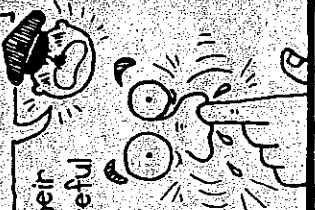
they store called histamine (his-ta-mein). This widens gaps between cells in blood vessel walls - allowing killer white blood cells (see opposite) to leave the blood and fight the invaders. Meanwhile,

watery snot is released to flush out the enemy!



## ALL NOSE-PICKERS SHOULD BE COURT-MARTIALED!

Some humans pick snot from their noses and eat it. This disgraceful habit allows germs caught in the mucus to enter into the guts where they can cause diarrhoea if not dissolved by acid in the stomach.



## 3 Bloody warfare

a) As a result of the gaps forming between cells, the blood vessels naturally get larger and more blood rushes to the area making it feel hot. That's why body parts, where there are germs, appear red and swollen.

b) Germs can die if they get too hot - so we aim to make 'em sweat by heating up the blood! White blood cells send chemical signals to the brain, which responds with chemicals that cause

the body's cells to make energy faster. This gives off extra heat. The skin turns pale as blood is retained deep within the body so it doesn't lose heat to the air. Humans call this "fever" - I call it a jolly good tactic!

