

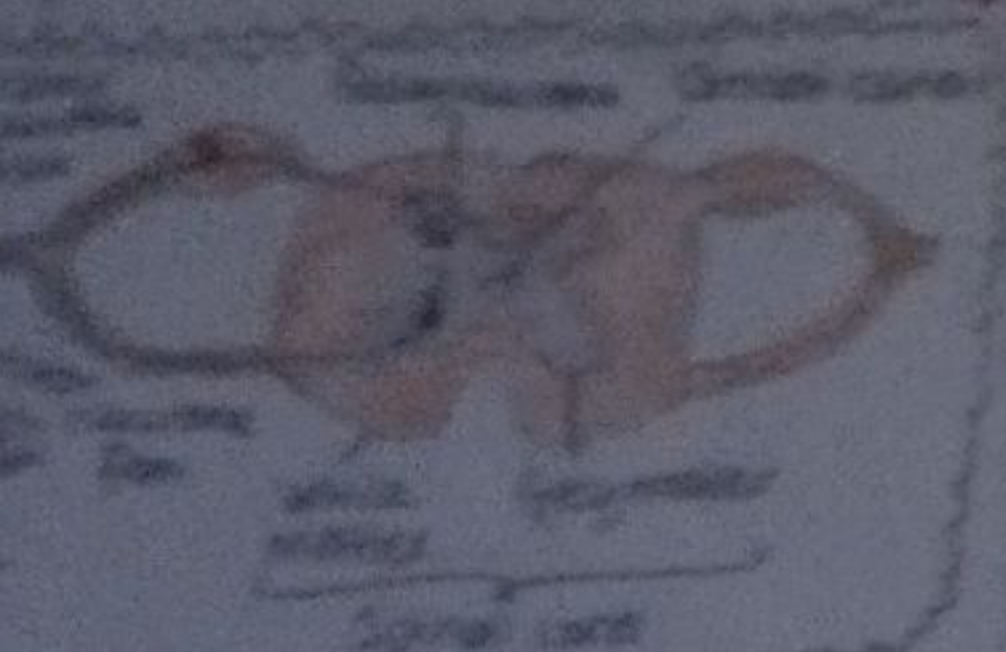
Option E: Neurobiology and behaviour

Stimulus

- Stimulus change in environment (light or chemical) perceived by a receptor and passing a signal
- Receptor: receptor in retina
- Visual input, which sends message

Stimulus change in environment

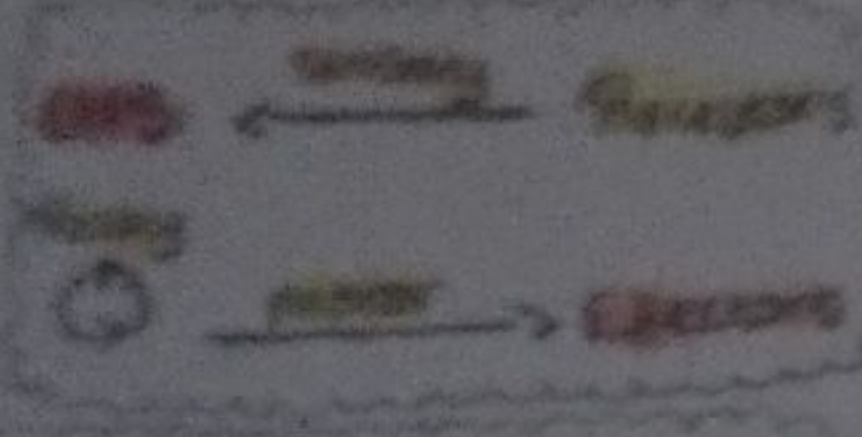
1. Light enters eye
2. Light receptors react to pressure
3. Light receptors in sensory neurons
4. Signal impulse to sensory neurons
5. Chemical message via sensory neurons
6. Signal impulse to motor neurons
7. Impulse carried to effector
8. Effector (e.g. muscles) reacts



Stimulus change

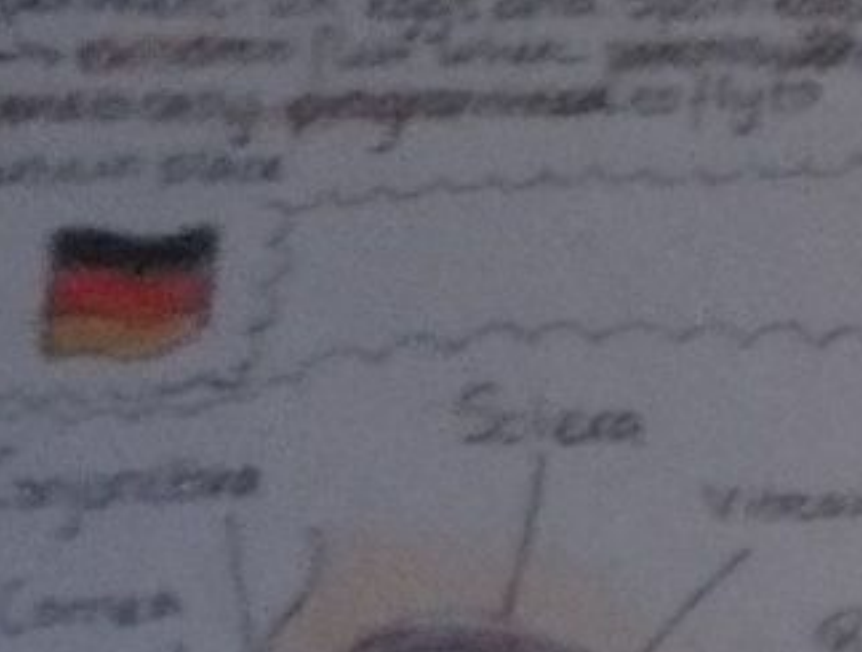
- Stimulus change in light wavelength (which is fast and quick)
- Some stimulus change in water flow (which is fast, slow)
- Over 40 years, 15 species of fish are produced
- Over 40 years, 15 species of fish are produced

Best: spawning at day-spawning



Stimulus change in environment

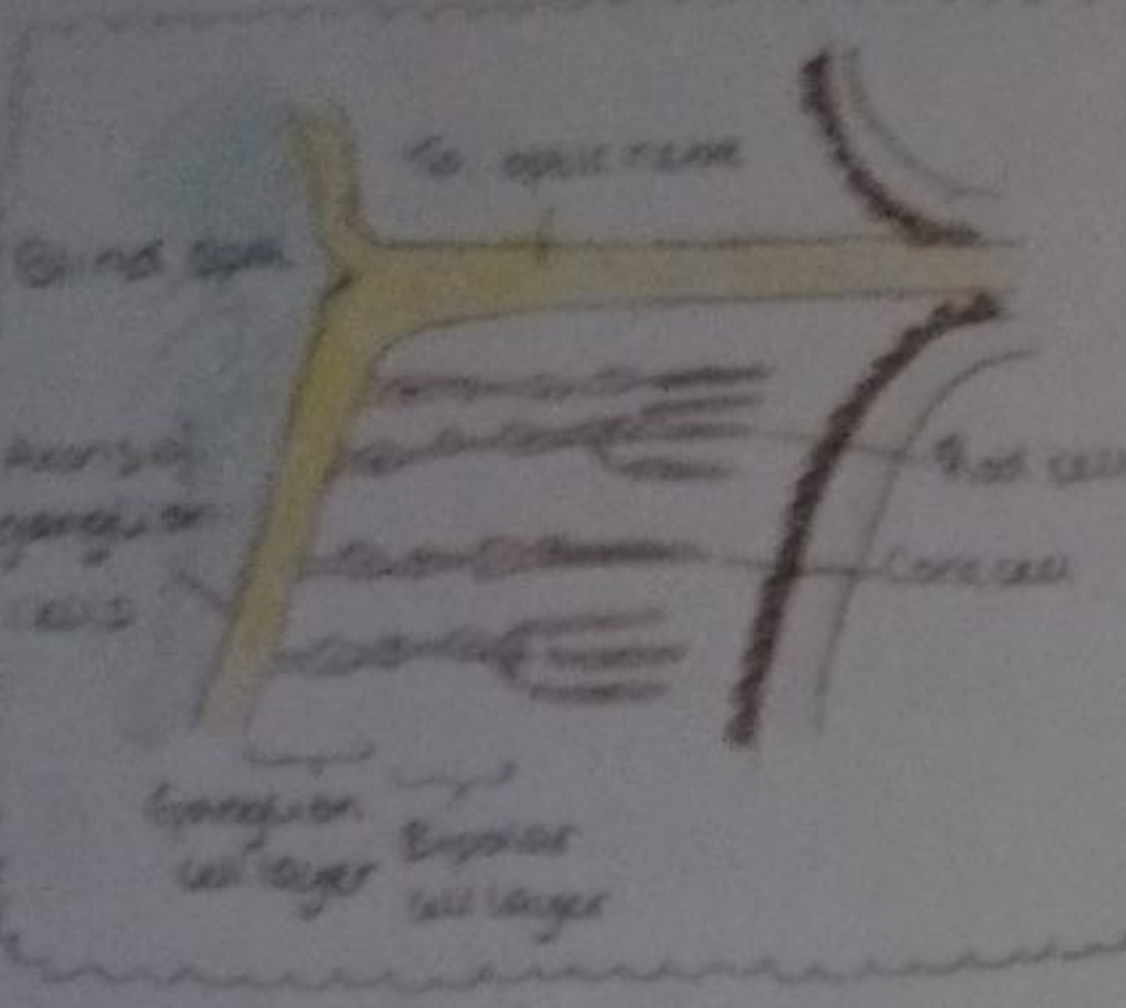
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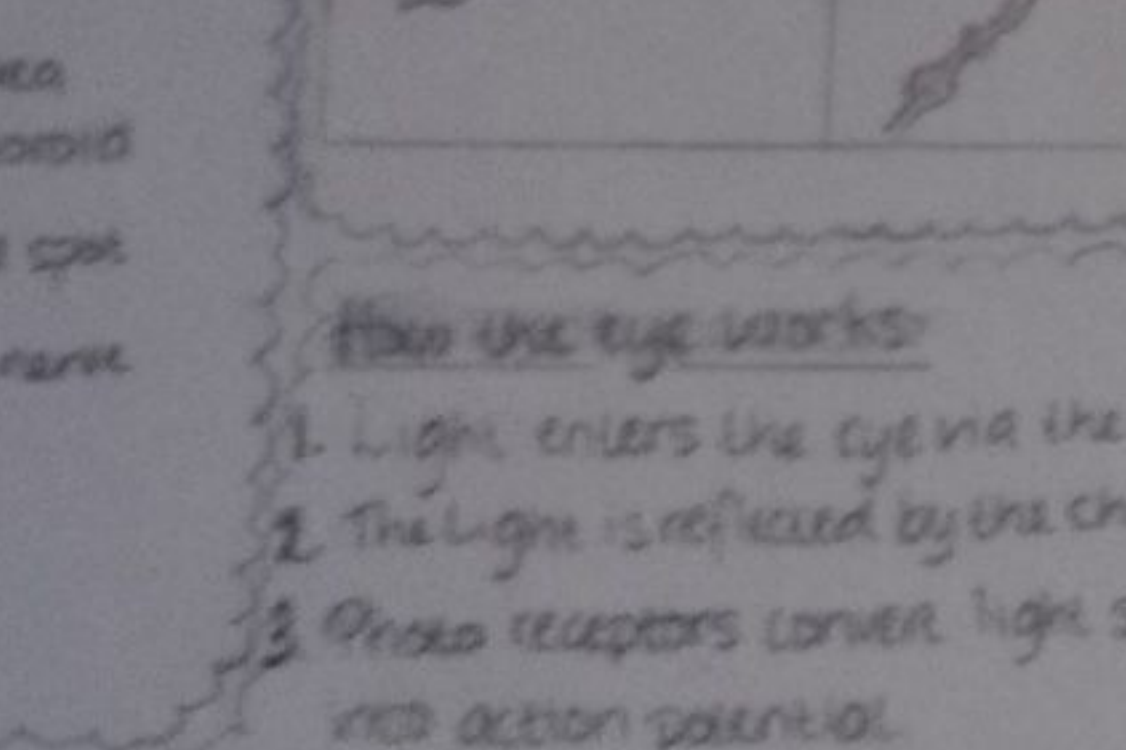
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- Cone cells**
 1. Colour vision
 2. Sharp vision
 3. Signal from single cells to optic nerve
 4. Bright light condition
- Rod cells**
 1. Central vision
 2. One type of rod (absorb all wavelengths)
 3. Signal from group of rods to optic nerve
 4. Dim light condition



How the eye works

1. Light enters the eye via the lens
2. The light is reflected by the choroid cells
3. Photo receptors convert light stimuli into action potential
4. Retinal ganglion cells transmit the impulse to the occipital lobe of the brain via the optic nerve

The processing of visual stimuli

When looking at an object, light rays pass through the pupil and are focused by the cornea, lens and humours. The image focused on the retina is upside down and reversed from left to right. When the photoreceptors of the retina are stimulated → send impulse to the bipolar neurons and the ganglion cells. This connects to the brain which turns the image right.

- Stimulated photoreceptors
- Bipolar neurons
- Ganglion cells and axons
- Optic disc and optic nerve
- Visual area of cerebral cortex

Processing and coordination of images

- Edge enhancement**
 - Hermann Grid Illusion: Grey spots are in peripheral vision, where there are fewer light-sensitive cells than in the fovea.
 - Message of grey instead of white
 - Edges more distinct

Controlateral processing

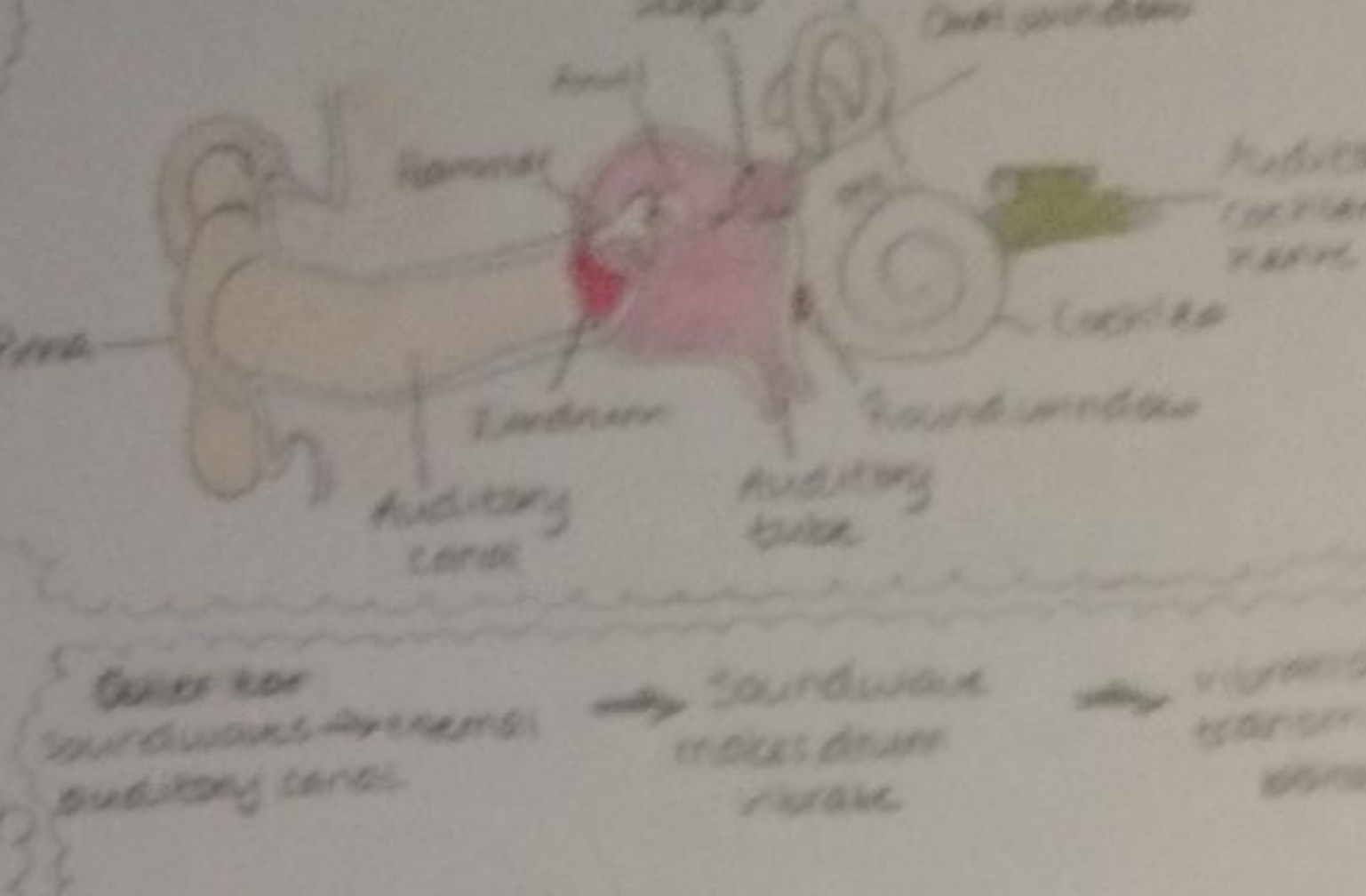
- "Opposite side"
- Due to optic chiasm
- Information from right side → left brain side, vice versa
- Both needed to fully understand

Pavlov's Classical Conditioning

- Used to alter reflexes
- Unconditioned stimulus → unconditioned response
- After a while, replace UCR with Neutral stimulus

Stimulus

- Stimulus → participant responds with UCR to NS
- NS → conditioned stimulus
- New UCR → conditioned response
- Outline: food → salivation, food + bell → salivation, bell → salivation



Sound waves

- Outer ear: sound waves enter ear canal
- Sound waves make eardrum vibrate
- Vibration is transmitted to ossicles
- Ossicles: malleus, incus, stapes
- Stapes: pushes on cochlea
- Cochlea: sends signal to auditory nerve

Sound waves

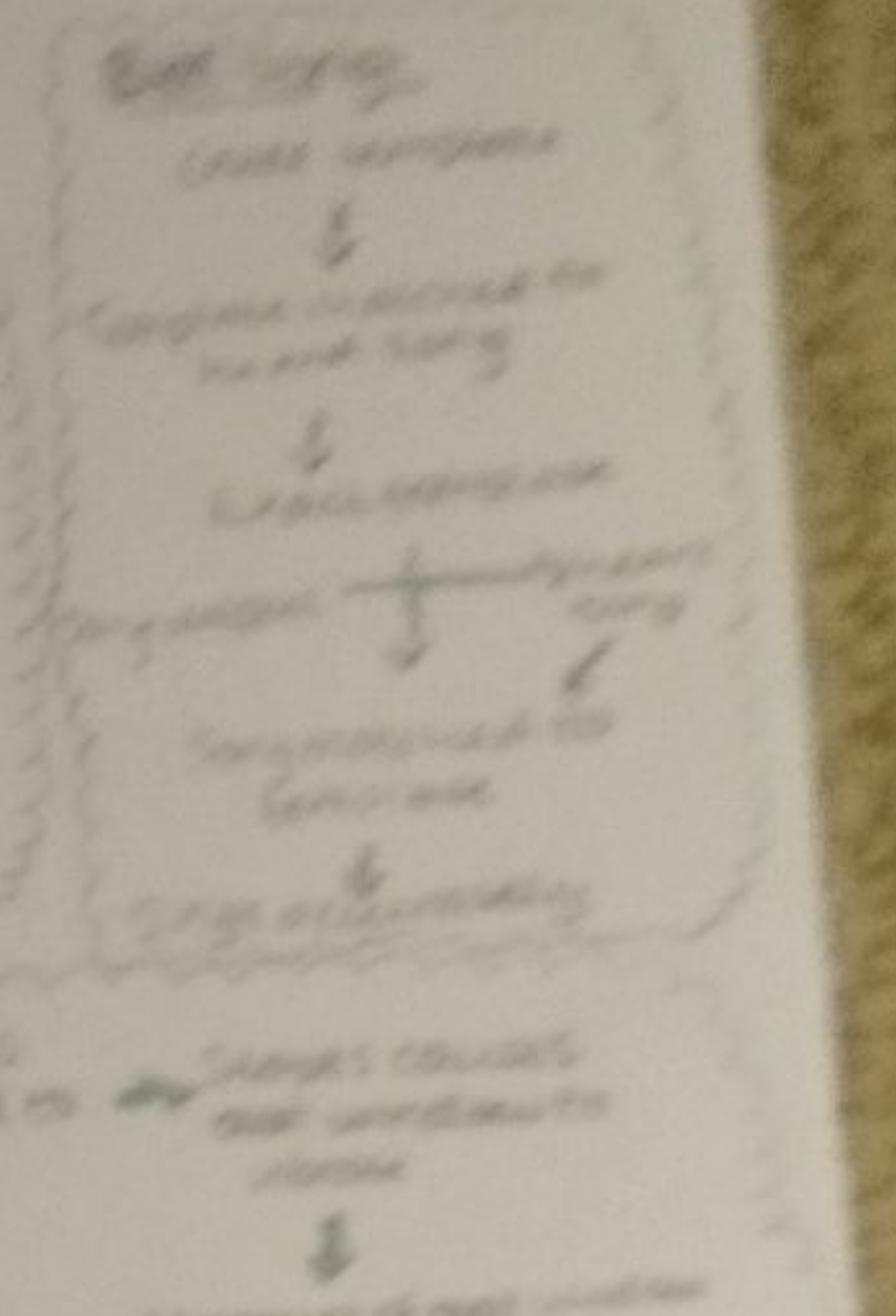
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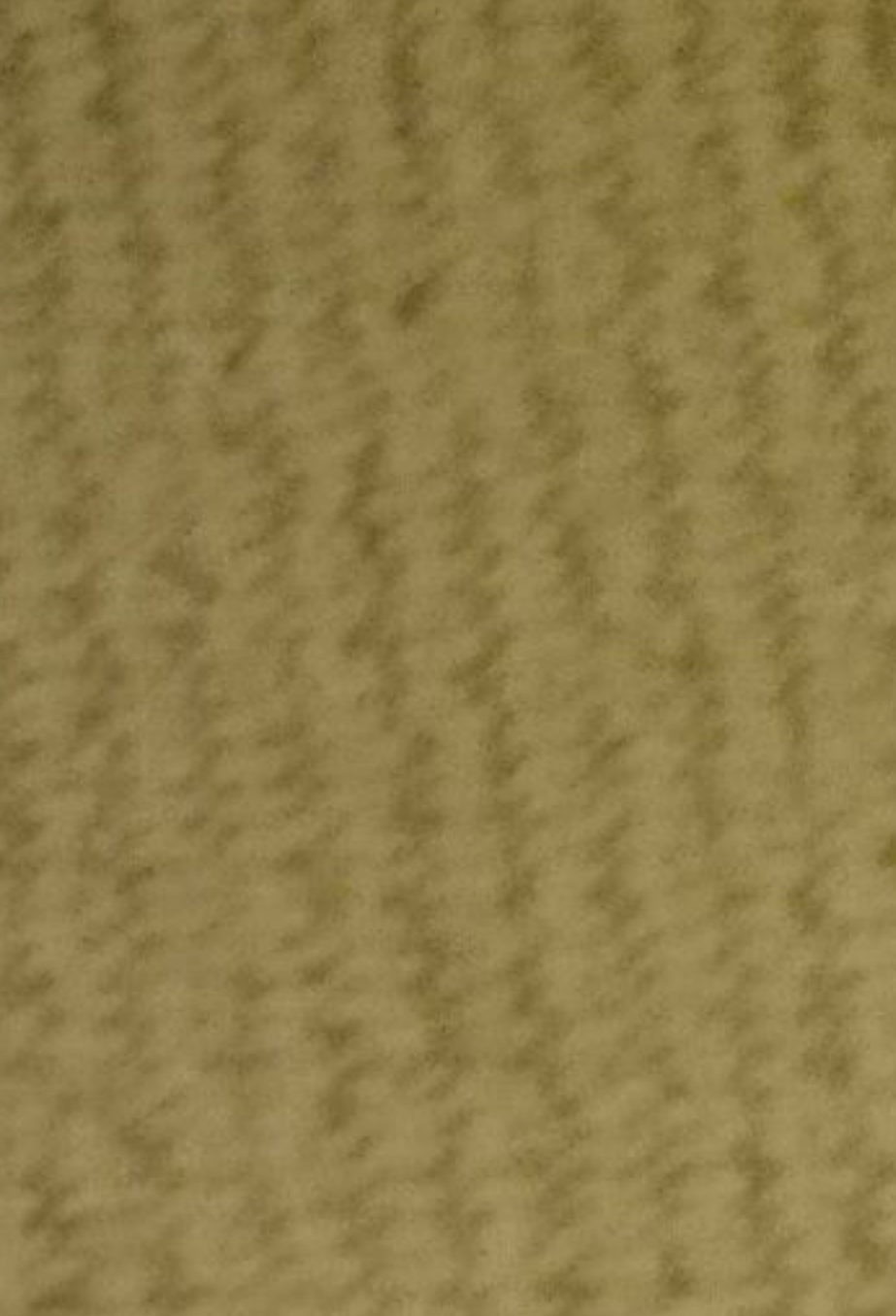
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