Fun with macro

What does ‘macro’ mean?

- Generally, macro means the image (on the film or sensor) is larger than the subject
- However, the term is not usually taken to embrace microphotography.
- A macro lens is optimised for macro photography …
- … although a ‘conventional’ lens can be used with extension tubes or bellows

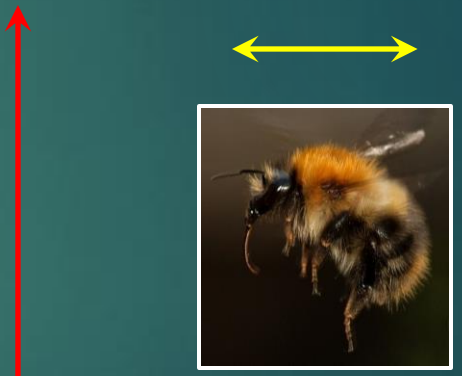
What does ‘macro’ mean?

- In addition, some zoom lenses have a ‘macro’ mode – which may or not be capable of macro imaging in the sense of the previous slide
- I won’t be saying any more about macro in that sense

The depth of field problem

- Macro involves an unusual geometry:
  - Nearly always, Subject distance ~ Lens diameter
- Often, Necessary depth of field ~ Subject distance
- This means that a very small aperture is often necessary to give adequate depth of field

The depth of field problem



The depth of field problem

- Also, if the subject is moving or the camera is hand-held then we need a fast shutter …
- … which means that getting bright enough illumination (to allow small aperture and fast shutter speed) is often a problem

The depth of field problem

The depth of field problem

The illumination problem

- If subject and camera are stationary, there is no illumination problem
- Otherwise, there is the problem of getting enough light on the subject to allow good depth of field with a fast-enough shutter speed
- Often, direct sunlight is not bright enough with a moderate ISO value

Ring flashes

- One good solution is a ring flash
- This is a circular flash tube (or pair of flash tubes) which surround the lens and delivers intense illumination direct to the subject
- LED ring flashes also exist, but …
- Such close-in illumination often makes the background dark or even effectively black

Ring flashes

- Typically, the ring flash attaches to the lens using a simple adaptor ring which screws into the len's filter thread

Ring flashes

Ring flashes

Ring flashes

- Sometimes, diffusing and coloured filters are provided
- In ‘two tube’ ring flashes, it’s possible to independently control the two tubes …
- … and by rotating the ring flash on its adaptor the direction of illumination can be controlled

Ring flashes

Hadrian
(76 - 138)

Denarius

Ring flashes

Hadrian
(76 - 138)

Denarius

Ring flashes

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(76 - 138)

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Ring flashes

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(76 - 138)

Denarius

Extension tubes & bellows

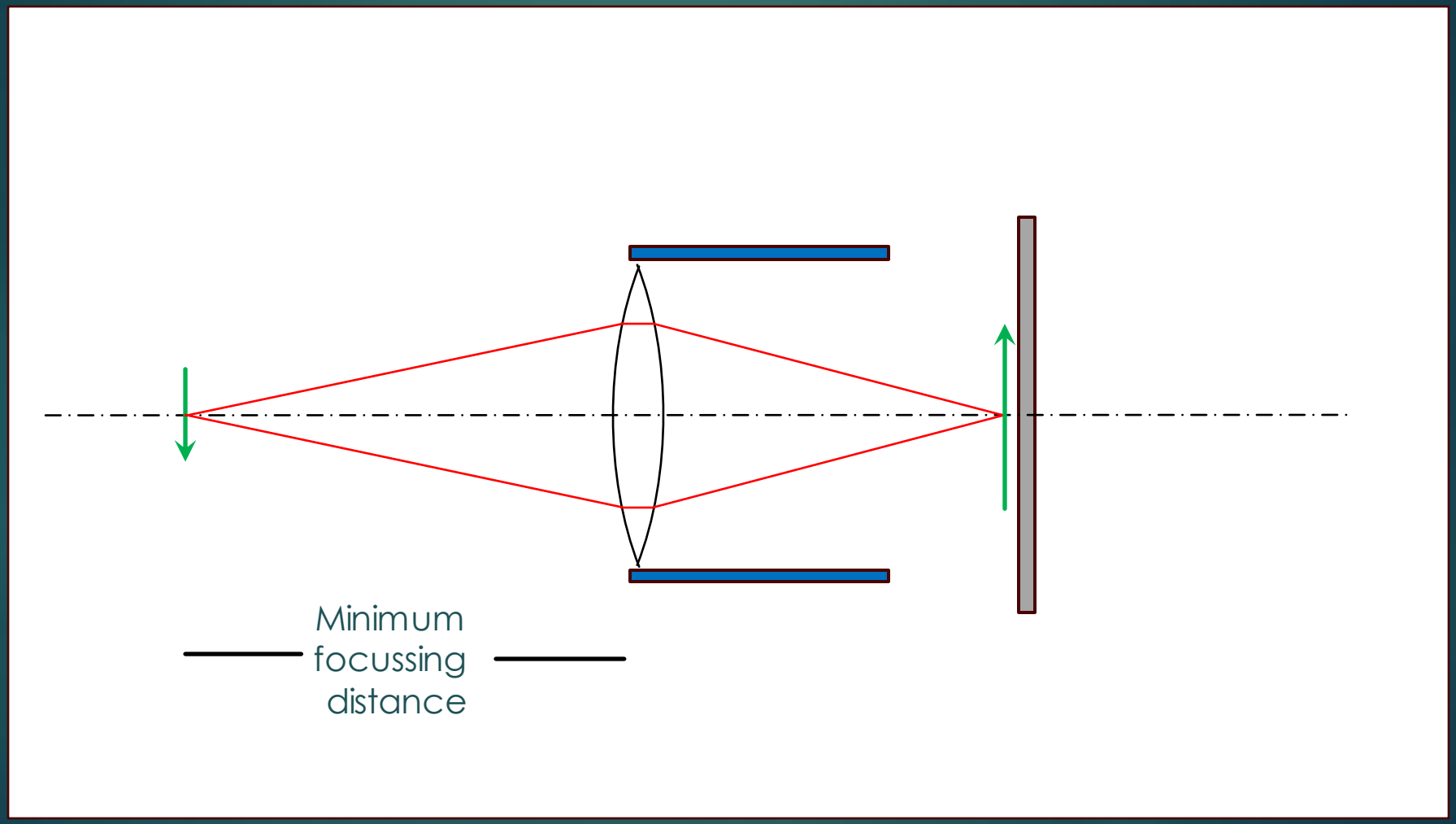
- A macro lens can focus very close – typically a centimetre or less
- A wide range of focal lengths are available
- The examples here are for 60 mm focal length
- Alternatively, a ‘standard’ lens can be used with extension tubes

Extension tubes & bellows

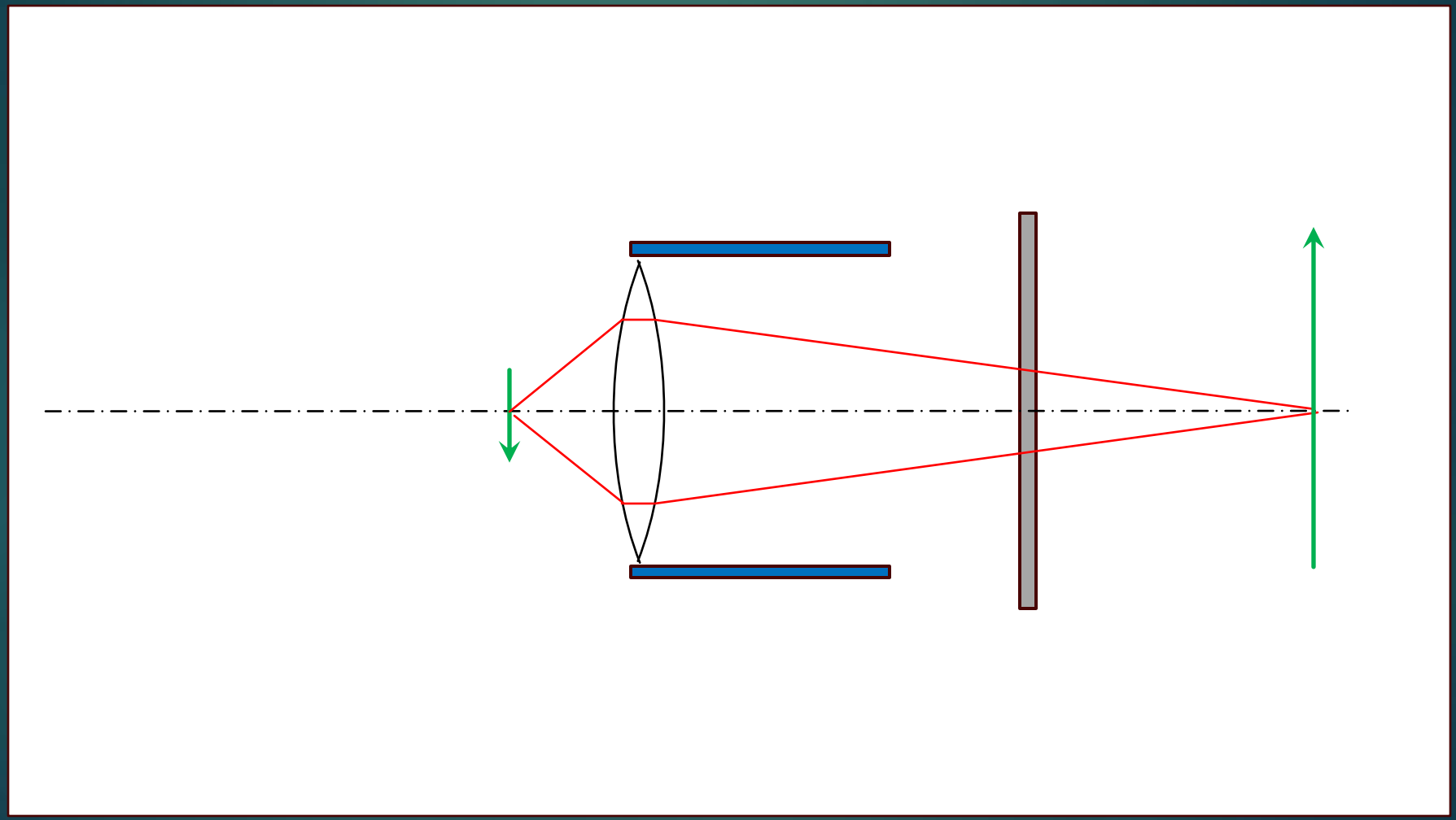
Extension tubes & bellows

Extension tubes & bellows

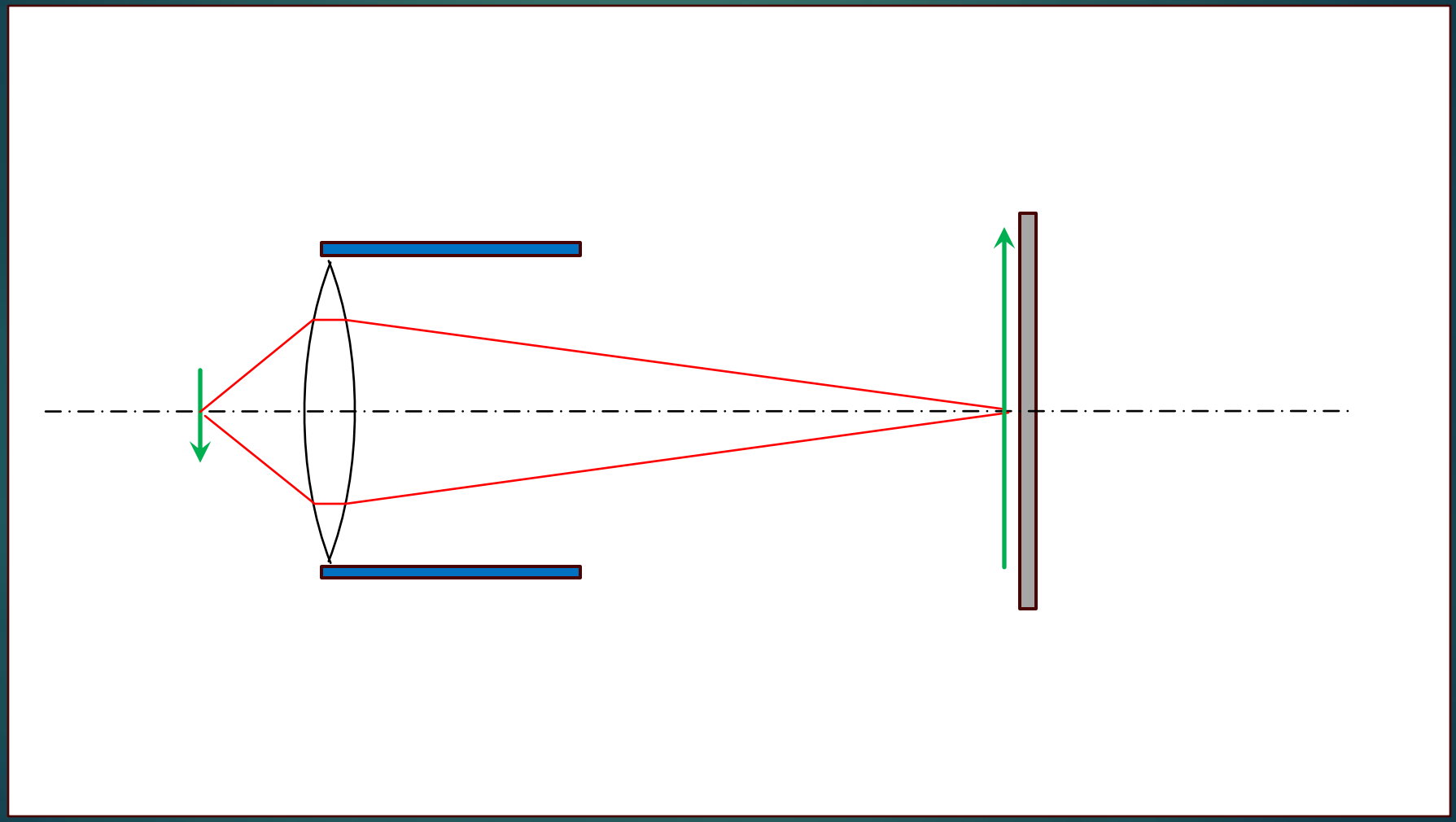
Extension tubes



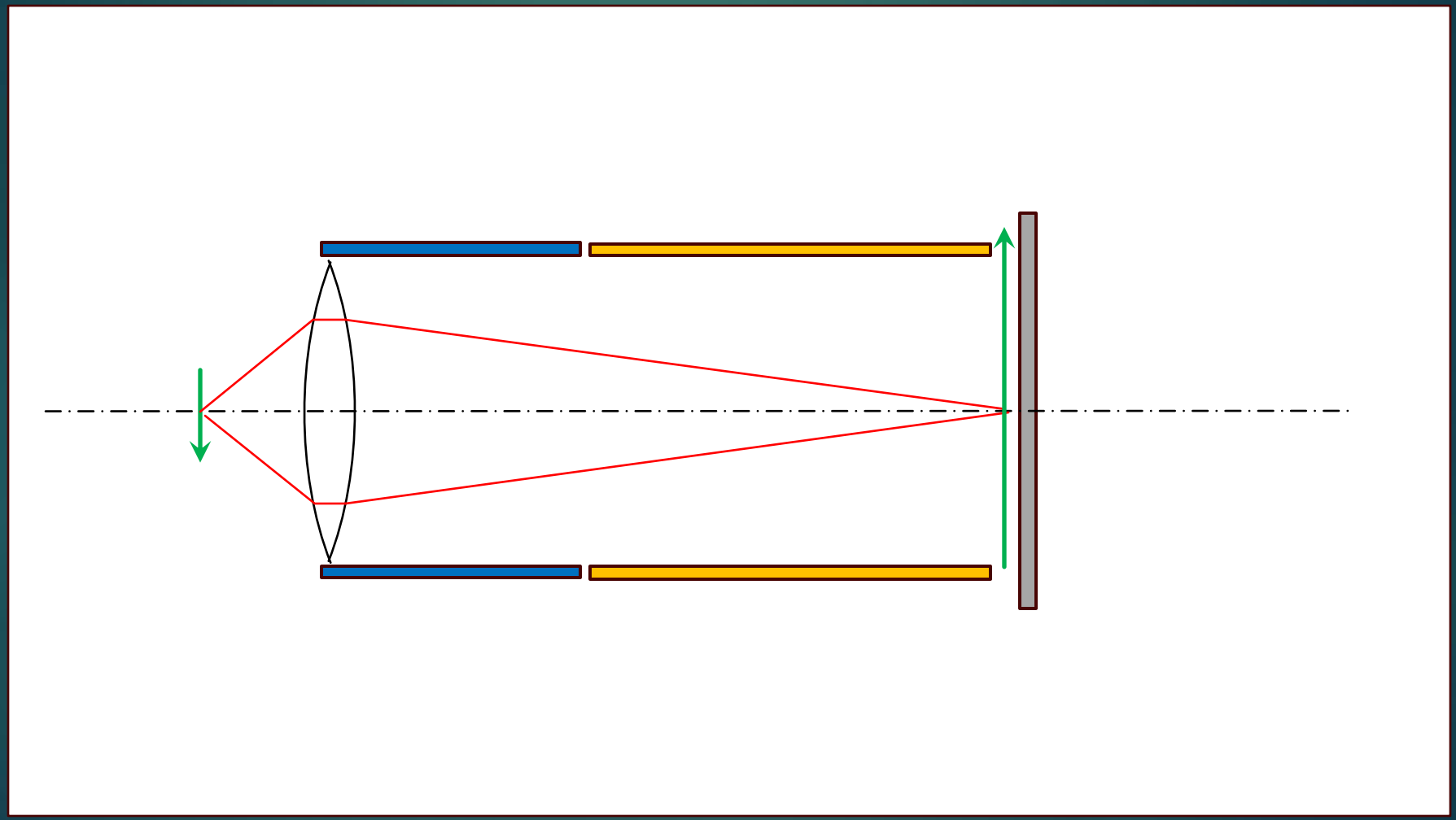
Extension tubes



Extension tubes



Extension tubes



Tubes & effective aperture

- With an extension tube, the aperture of the lens becomes effectively smaller …
- … so, the f-number becomes larger
- A few examples:
  - Magnification = 1 → Double the f-number (2 stops)
  - Magnification = 2 → Triple the f-number

Subjects

- Insects & arachnids
- Botanical
- Other natural subjects
- Coins and collectibles
- Jewellery

Insects & arachnids

- Some little critters are harder to scare than others …
- … and so easier to photograph
- Bumble bees are slower and less timid than most
- Spiders (which tend to be big in autumn) are fairly easy – but it's also easy to inadvertently touch the web
- Critters can often be quite dirty – e.g. pollen on bees
- Everything is slower when it's cold

Insects & arachnids

Insects & arachnids

Insects & arachnids

Other natural subjects

Coins & collectibles

Septimius Severus
(145 – 211)

Denarius

Coins & collectibles

Septimius Severus
(145 – 211)

Denarius

Jewellery

Jewellery

Jewellery

Post-processing

- Arguably, a macro image offers post-processing freedom which is not usually available.
- For example, does anyone know what is exactly the right way up for an insect or a flower?
- Likewise, for a subject most people haven't seen really close what is the right colour balance?
- And …

Post-processing

- For a subject most people haven't seen really close, perhaps you can get away with a bit more sharpening?
- Last but not least, if you are using a ring flash then often the background will be dark and/or almost featureless …
- … which means that a whole range of cropping options are available

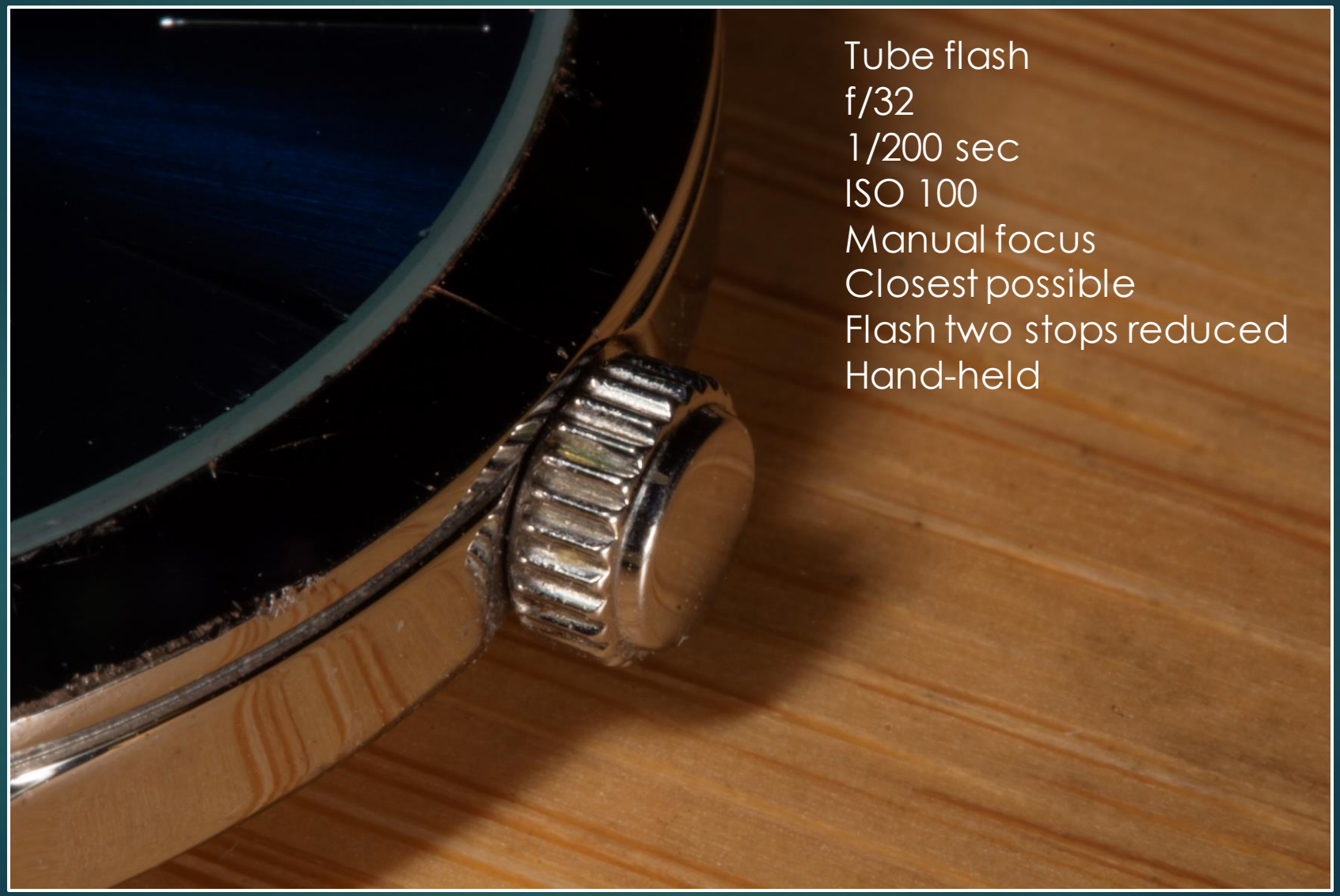
‘Tube’ versus LED ring flashes

- Two ring flashes have been informally compared:
  - Sigma EM-140DG (flash tube):
    - GN 14 m at ISO 100
  - Neewer RF-550D (LED):
    - GN 15 m at unstated ISO
    - Flash duration 1/100 sec
- The second of these is much cheaper than the first

‘Tube’ versus LED ring flashes

- What should a ring flash do for us?
  - Allow small aperture (as discussed)
  - Freeze subject motion
  - Freeze camera motion
  - Help isolate subject from background
- How well does the Neewer LED ring do these things?

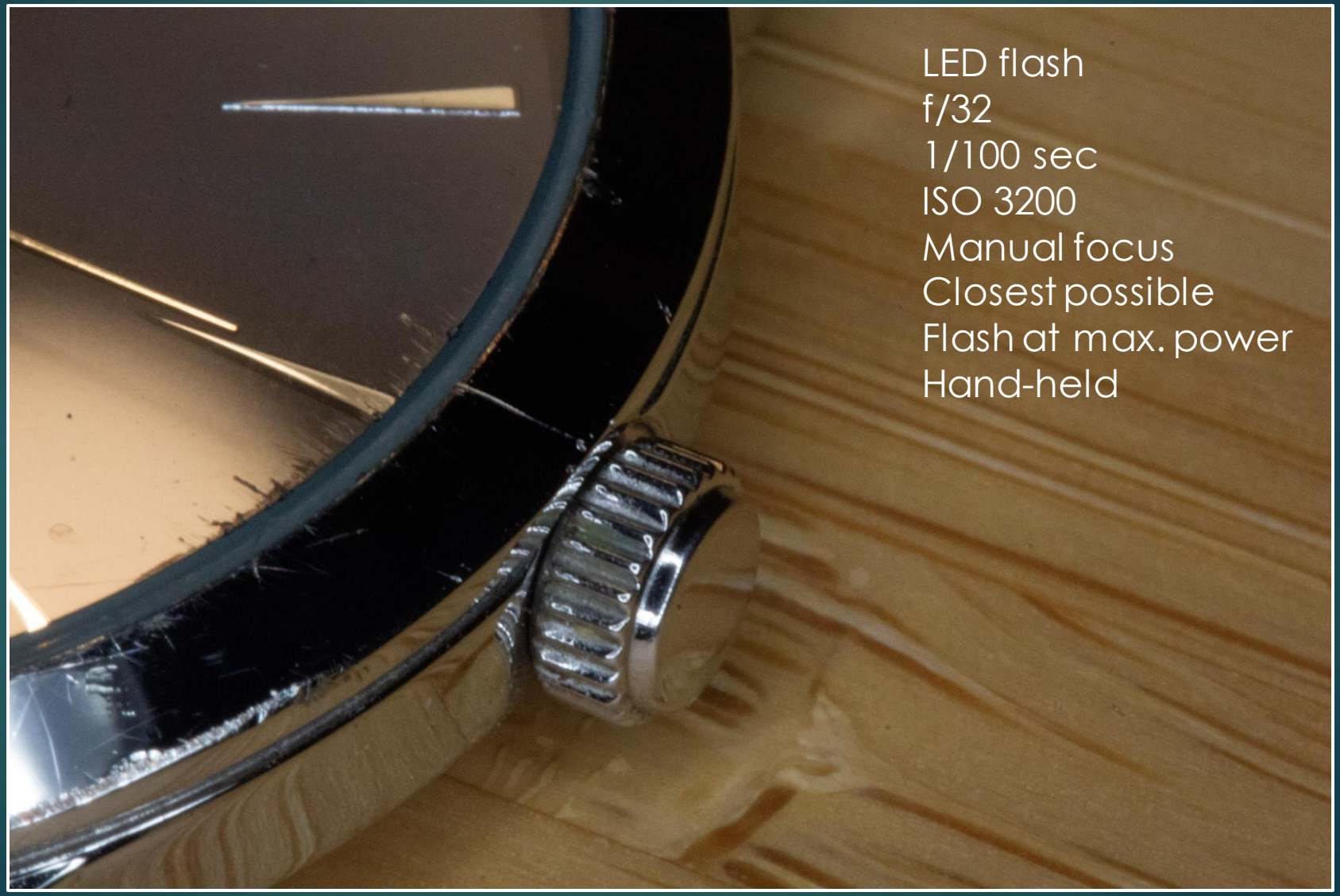
‘Tube’ versus LED ring flashes



‘Tube’ versus LED ring flashes

Tube flash
f/32
1/200 sec
ISO 100
Manual focus
Closest possible
Flash two stops reduced
Hand-held

‘Tube’ versus LED ring flashes



‘Tube’ versus LED ring flashes

LED flash
f/32
1/100 sec
ISO 3200
Manual focus
Closest possible
Flash at max. power
Hand-held

‘Tube’ versus LED ring flashes

- Provisional and unscientific conclusions:
  - The GN quoted for the Neewer ring flash is definitely not at ISO 100 (or anywhere near)
  - However, at rather high ISO useful freezing of camera motion is (at least sometimes) achieved …
  - … and this may read across to useful freezing of subject motion

THE END!