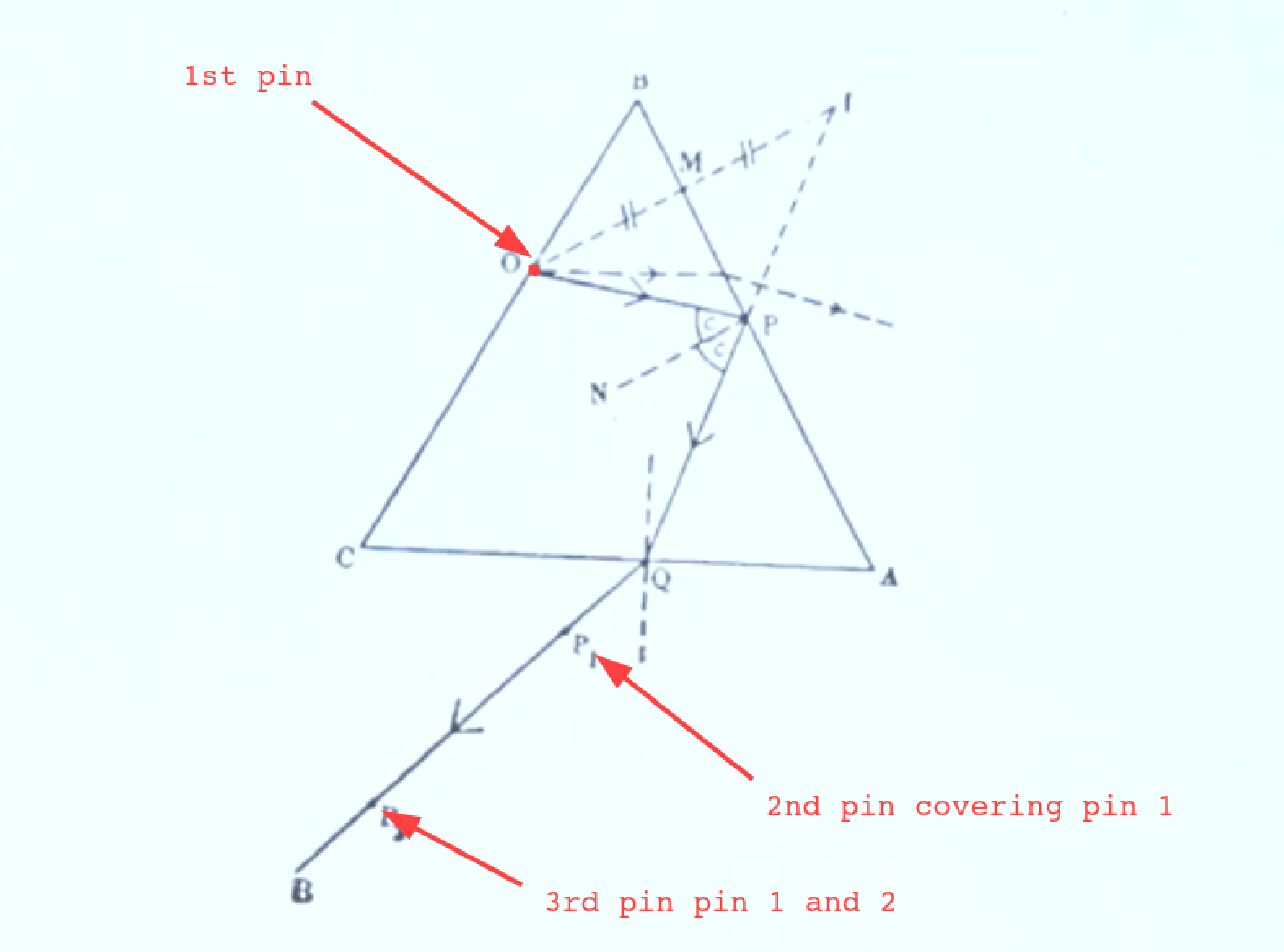
- Initial setup



> We have to mark the 2nd pin at the last instance which we can see the image of pin 1. This should be observed by taking your eyes from A to C. Then place the pin 3 to cover the images of both pin 1 and 2.

Then we create a perpendicular line OT to BA such that OM = MT, then we join the line joining the pin 2 and pin 3 to AC surface calling the intersection point Q.Then join Q and T call the intersection point of QT as P. Finally join OP. Then the OPQ angle is equals to twice of the critical angle (OPQ = 2c)

If we call the OPQ angle α, then the refractive index of the glass block can be found,

$$\alpha = 2c$$
$$\frac{\alpha}{2} = c$$

$$sin(c) = \frac{n_{rare}}{n_{dense}}$$
$$sin(\frac{\alpha}{2}) = \frac{n_{air}}{n_{glass}}$$
$$sin(\frac{\alpha}{2}) = \frac{1}{n_{glass}}$$

$$\therefore n_{glass} = \frac{1}{sin(\frac{\alpha}{2})}$$

Important points

- Why do we have to keep the 1st pin in contact with the prism instead of keeping it closer to the BC surface?

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To avoid the effect of reflection and refraction happening.
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- Why would we have to cut the pin head when we are doing this experiment?

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If the pin is shorter than the prism, when we keep the pin in contact the pin head would create a space between the prism surface and the point where the pin is placed. So to avoid this we need to remove the pin head.
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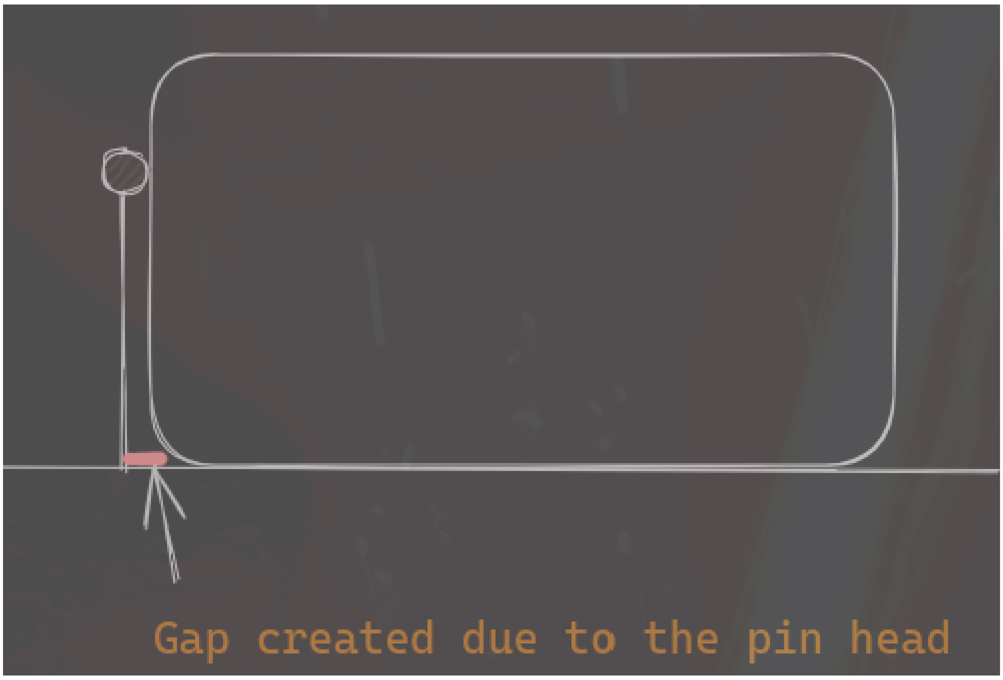

- How would we use this method to find the refractive index of a liquid?

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Take a glass slide with a drop of the liquid we need to find the refractive index of and keep the slide in the side that the total internal reflection happens in the prism (AB) and repeat the experiment.
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- When we use this method and find the critical angle for glass water interface, compare that with glass air critical angle?

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c for glass water > c for glass air

This is beause water's refractive index is greater than air
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$$n = \frac{1}{sin(c)}$$
$$\therefore n \propto \frac{1}{c}$$

> So when `n` increase c will decrease