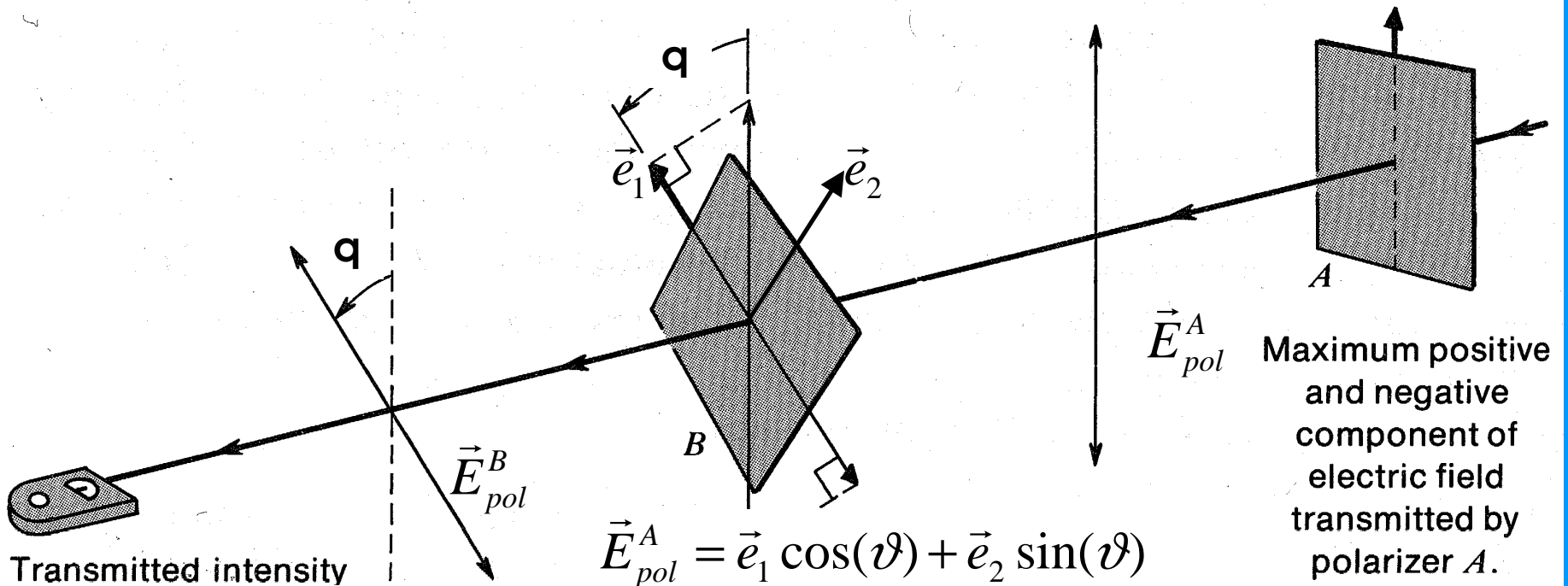


## Two subsequent polarizers for light waves

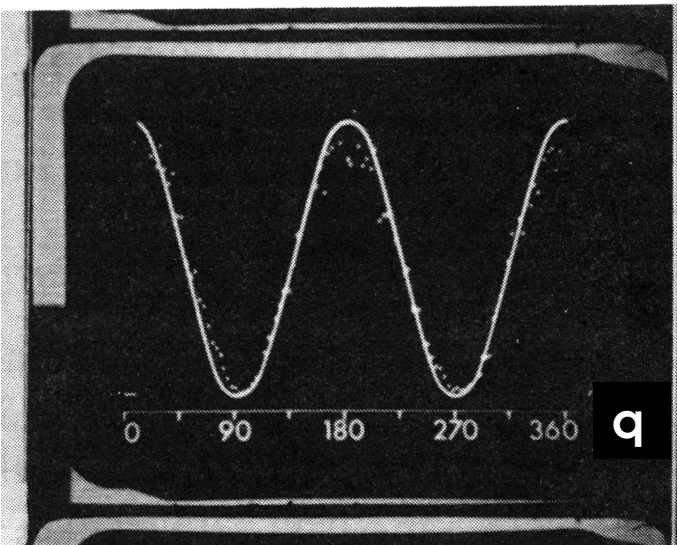


$$\vec{E}_{pol}^A = \vec{e}_1 \cos(\vartheta) + \vec{e}_2 \sin(\vartheta)$$

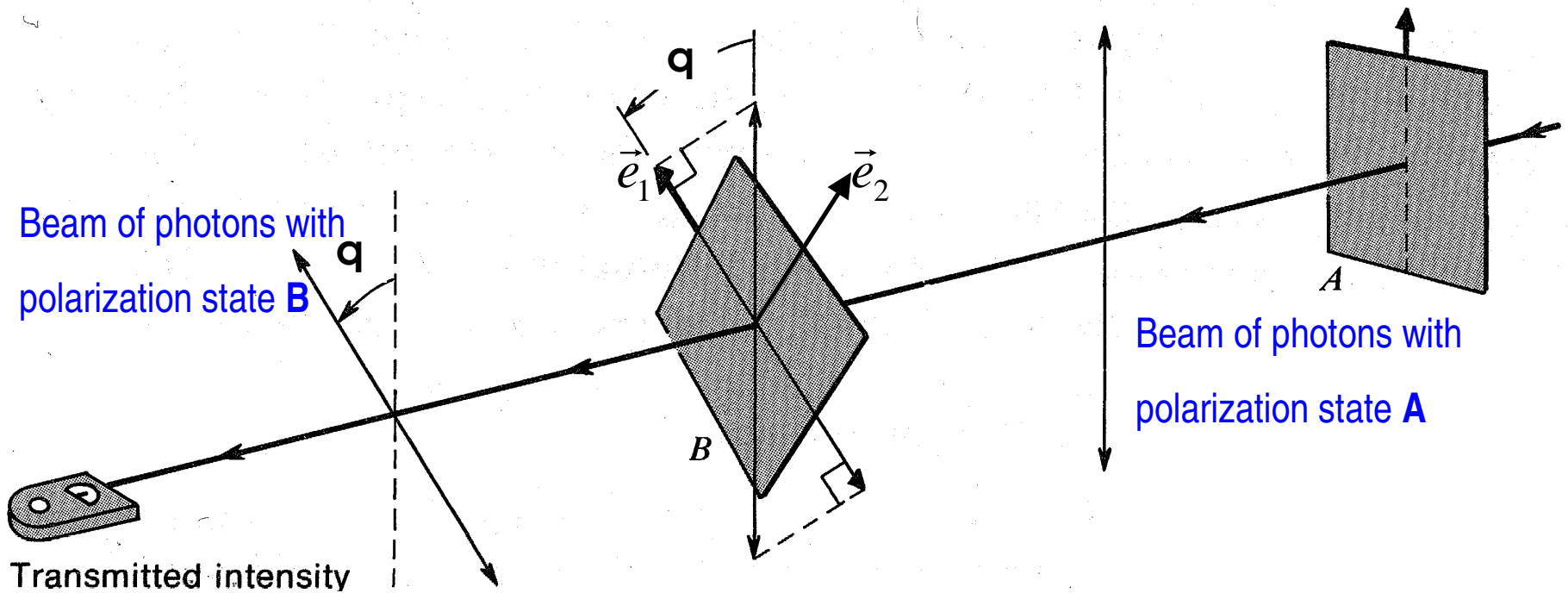
$$\vec{E}_{pol}^B = \vec{e}_1 \cos(\vartheta)$$

- A) Polarizer A produces a linear polarized beam.
- B) Polarizer B only transmits the field component parallel to its polarization .

Transmitted intensity:  $I^B \propto \cos^2(\vartheta)$



## Two subsequent polarizers for photons



1. A photon with energy  $h\nu$  cannot be split into two photons with less energy by a polarizer since polarizers do not change the frequency of light.
2. Even though all photons are in the same polarization state after polarizer **A**, some photons are transmitted through the polarizer **B** and some are not.

*A philosopher once said, "It is necessary for the very existence of science that the same conditions always produce the same results." Well, they don't!*