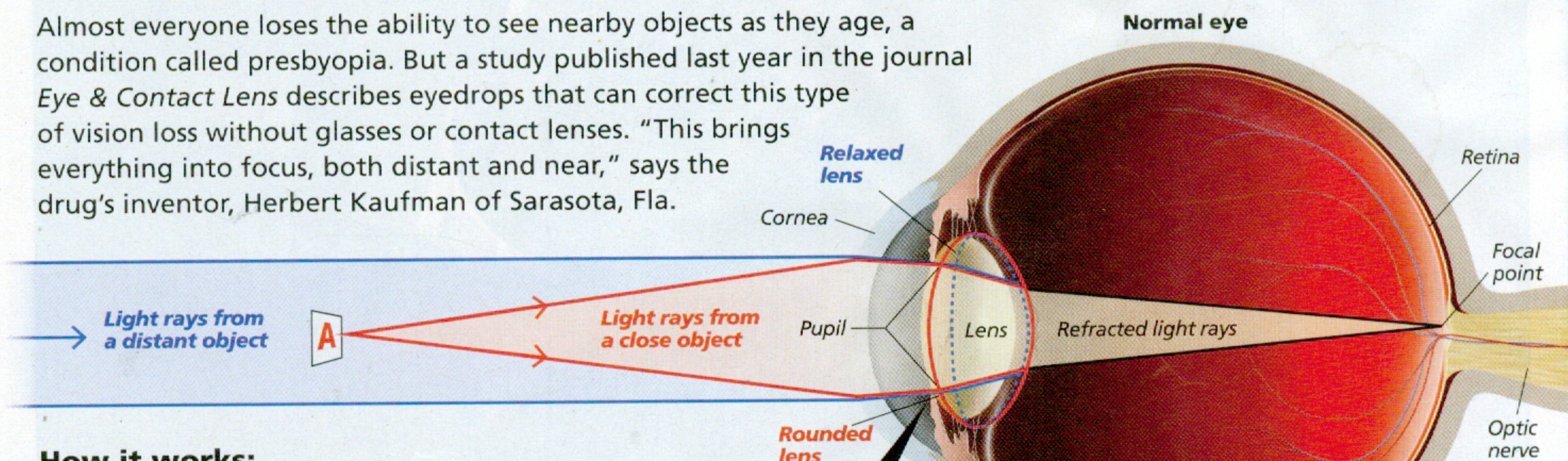


# A Drop of Relief

Corrective eyedrops could help you ditch your reading glasses.

Almost everyone loses the ability to see nearby objects as they age, a condition called presbyopia. But a study published last year in the journal *Eye & Contact Lens* describes eyedrops that can correct this type of vision loss without glasses or contact lenses. "This brings everything into focus, both distant and near," says the drug's inventor, Herbert Kaufman of Sarasota, Fla.



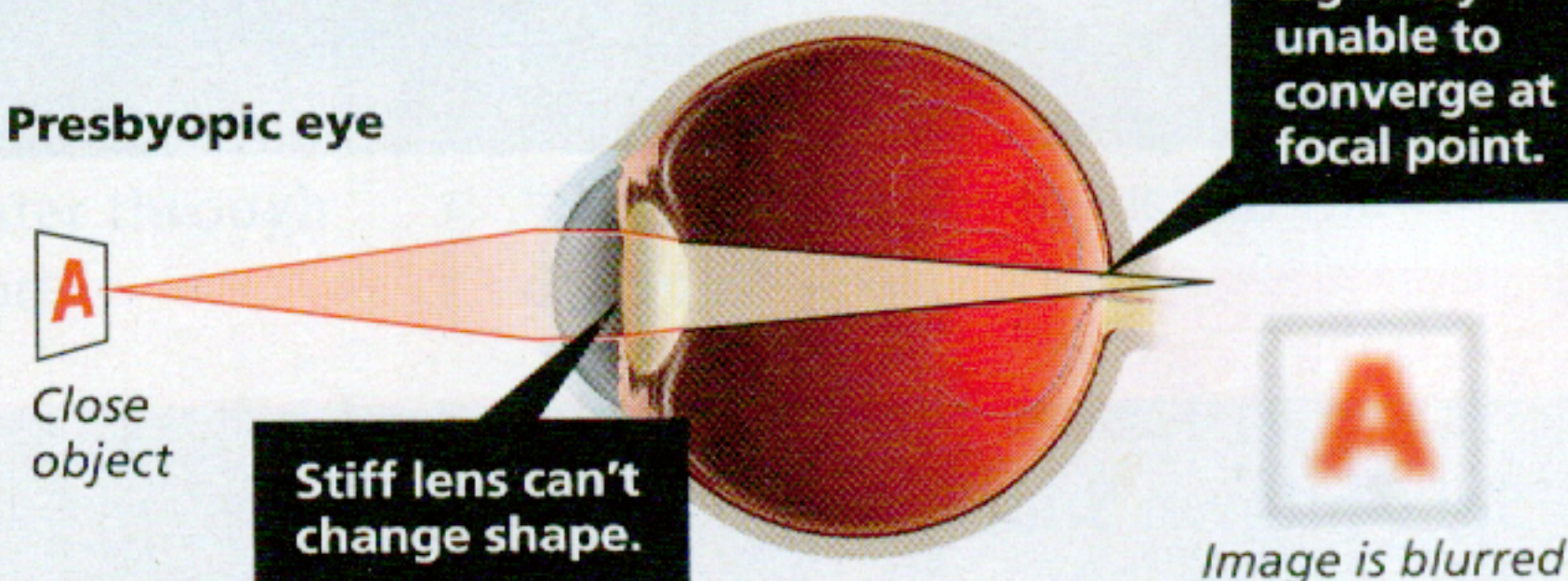
## How it works:

**1** Light rays from distant objects are mostly parallel by the time they reach your eye. A relaxed lens can focus these rays on the retina with no effort. But most light rays from nearby objects (closer than 30 feet) enter the eye at an angle. The lens has to change its shape to focus these rays on the retina.

**2** As we age, the lens becomes stiff. It can still process distant objects with its natural shape, however stiff it is. But a presbyopic lens can no longer change to focus peripheral rays from nearby objects.

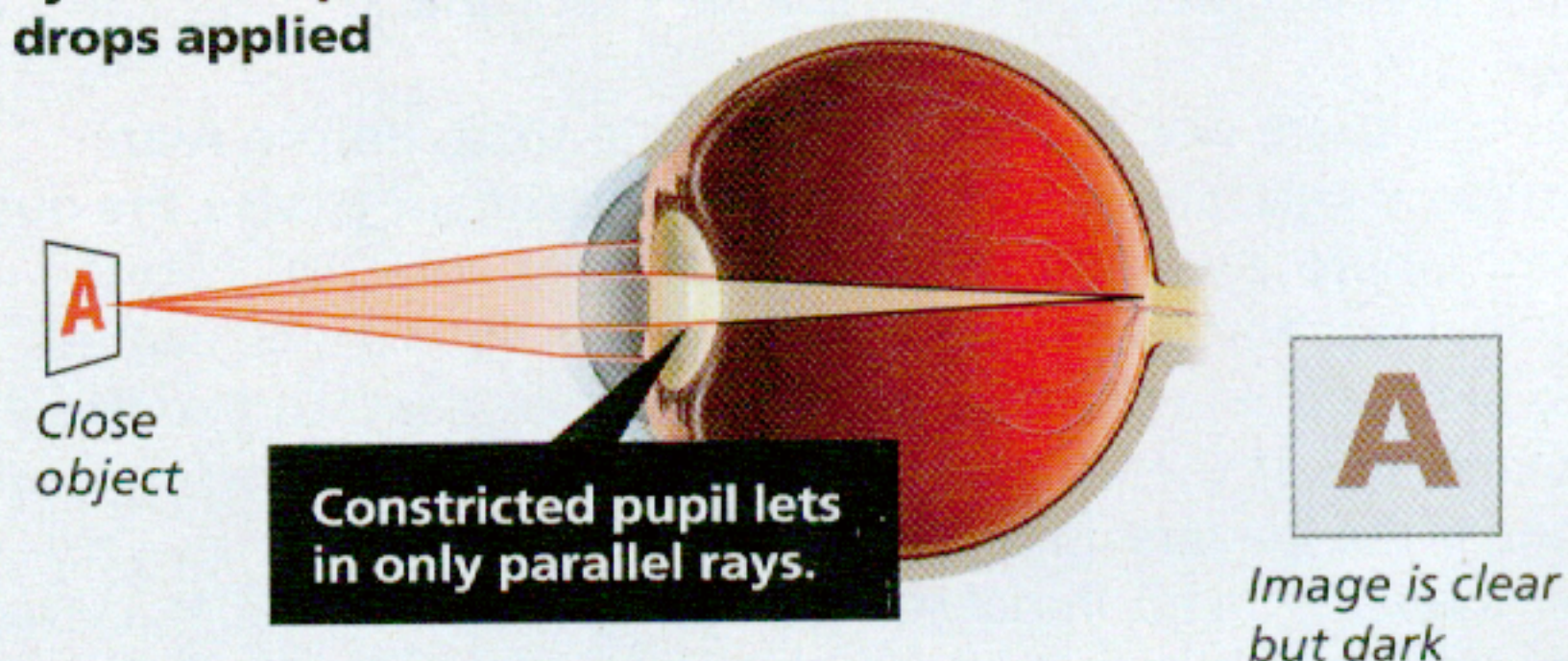
Reading glasses bend these peripheral rays. Seen through these artificial lenses, nearby objects are in focus, but distant objects are out of focus.

### Presbyopic eye

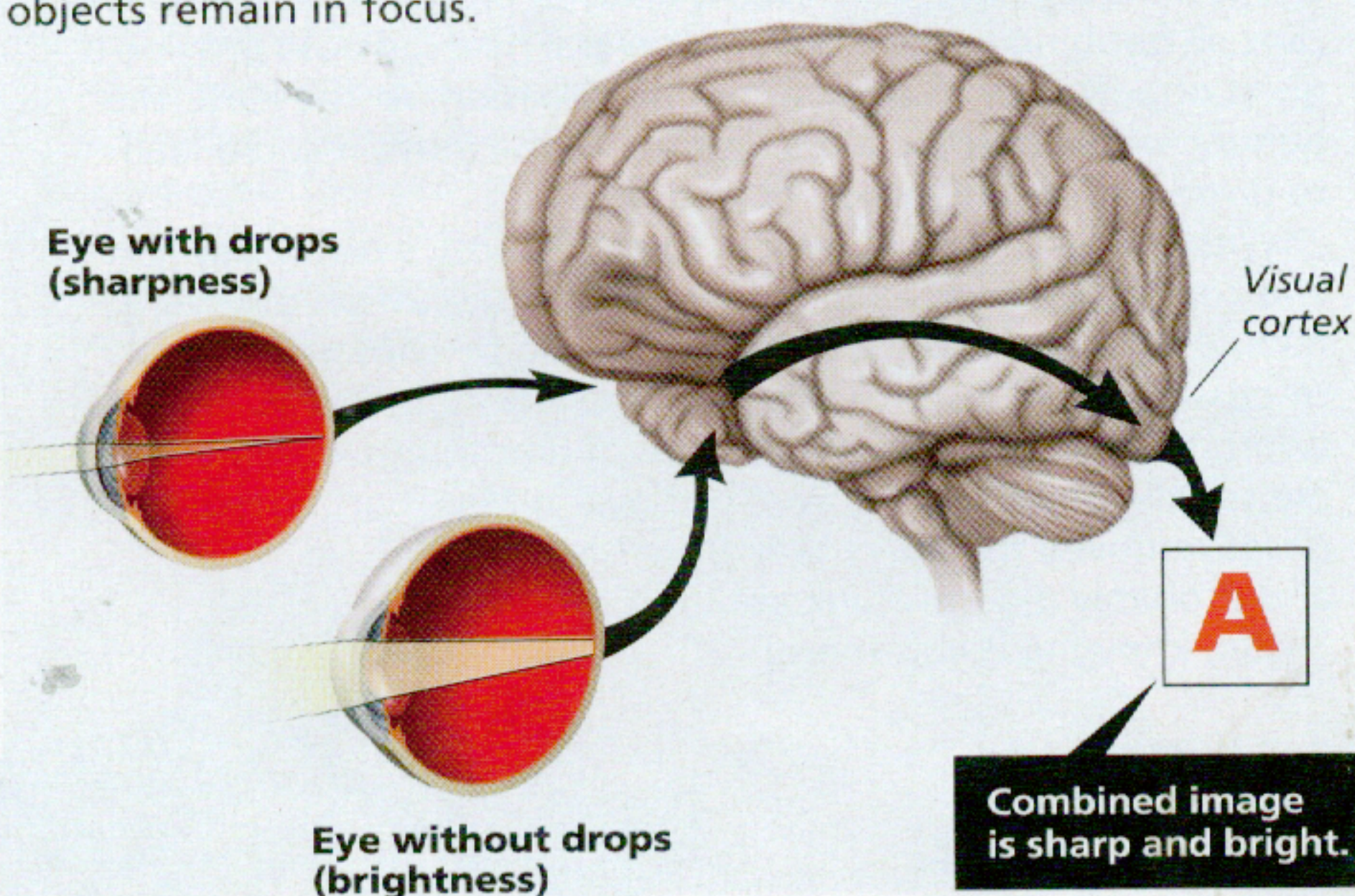


**3** The experimental new eyedrops combine two existing drugs, carbachol and brimonidine, which work together to temporarily constrict the pupil. This creates a pinhole camera effect. Pinholes do not bend light rays. Instead, they allow only the central light rays to pass through. Since these rays don't hit the eye at multiple angles, the lens doesn't need to change its shape. Both distant and near objects remain in focus.

### Eye with experimental drops applied



### Eye with drops (sharpness)



**4** With a smaller pupil, the eye admits less light. So the user puts the drops only in one eye. The brain combines the bright, blurry image from one eye with the sharp, dark image from the other to create an image that is both bright and sharp.

In the study, which included 48 people, the drops improved near vision well enough to read without glasses in the first hour. After that, the pupils gradually dilated, and vision declined over the next 10 hours, so the subjects had to put in new drops each morning. Kaufman hopes to find a drug company that will soon produce and market the eyedrops.

—LAIRD HARRISON