

# We need to ditch the pink ball in day-night test cricket

December 17 2015, by Derek Henry Arnold

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The [pink cricket ball](#) for day-night test matches in Australia is, at best, an unfortunate compromise with tradition. At worst it's a dumb decision that could risk lives.

To understand why you have to understand a bit about [colour](#) vision, that [people](#) have different visual sensations, and that men are the weaker sex.

Think of colour as a two dimensional surface. Move in one direction, things gets redder. In the opposite, greener. Shift left, yellower. Right, bluer. Human vision can estimate where a light rests within this colour space by estimating how well different mechanisms absorb light.

## The mechanisms of seeing colour

If there were only one mechanism there would be lots of confusion. Vision could only tell how different a light was from that maximally absorbed by the single mechanism. There are such people (about 1 in a million). For them there is no colour, just shades of grey.

Two mechanisms is better. Now you can distinguish between different colours, but there is still confusion.

A range of lights will be equally well absorbed by both mechanisms, and you won't be able to distinguish them. This is actually pretty common in up to 10% of males, but just 0.5% of females. See, men are the weaker

sex, more susceptible to this and other genetic conditions.

For full colour vision you need three mechanisms. Two of the three mechanisms in normal [human vision](#) maximally absorb lights roughly coinciding with red and green.

## Colour blind

One of these two mechanisms is most often missing in abnormal [colour vision](#). These people have particular difficulty distinguishing reddish and greenish things. People such as [Chris Rogers](#) and [Mathew Wade](#), until recently an opening batsman and wicket keeper in the Australian team.

It may surprise, but many people with colour-blindness are blissfully unaware of their situation.

People can be unaware of colour-blindness because colour naming is an association. Our visual systems generate sensations, and we learn to categorise them.

Other people point at something and tell us its red, so we learn to associate that sensation with the label "red". Ditto green. The sensations colour-blind people have are different to sensations other people have, but we all learn the same labels.

## What colours do you see?

Actually, we almost certainly all have slightly differing colour sensations, as we have slightly differing concentrations of the three [light](#) detecting mechanisms.

Human vision is not all about colour. It relies on two types of difference

(or contrast) – colour contrast and brightness contrast. When detecting movement, brightness contrast is much more important, but it's helped by colour contrast. Now for the pink [ball](#).

To make a fast moving object highly visible you need to maximise contrast between it and the background. In cricket, the background is typically the grass (green), players' clothes (traditionally white), sightscreens (also traditionally white) and the sky (traditionally blue).

Cricket Australia has now agreed to [look at the white stitching](#) to reduce the "glow" of the pink balls, but it remains happy the pink will stay and that's a concern.

The traditional red ball is actually darker than the grass, the players' white clothes, the white sightscreens and the blue sky. Colour-blind people may have increased difficulty spotting this against grass, but they can get by with brightness contrast.

What happens at night? The sky gets black. A big problem for everyone with a dark red ball. What to do? Why don't we make the ball brighter: pink rather than a dark red? Well that's what they did.

Lightening the ball, from dark red to pink, helps everyone (especially the TV audience) see the ball against a dark night sky, but it's a problem for red-green colour-blind people.

It lessens both any minimal colour contrast they could detect when the ball has a grass backdrop, and the brightness contrast they relied on in this situation.

Worse, as day turns to night, there is probably a period where there is little brightness contrast between the ball and sky. Fast moving objects with little brightness contrast can be seen by colour contrast, but they

look blurred and it's hard to judge their speed.

I suspect Australia's captain, Stephen Smith, could testify to this.

## **White balls are right**

The solution? Day-night tests could be played by women, lessening the problem. Better yet, a white ball shows up well against day and night skies, and against grass.

Not so good against white. You could paint the sightscreens black and get everyone to wear, preferably dark but at least coloured clothing. That worked for one-day cricket.

Why not a white ball? Because it's traditional to wear [white](#) while playing test cricket. Just as it's traditional to play during the day with a blue sky.

If one tradition can be put aside, we should probably do away with others. Otherwise colour-blind people in particular, and perhaps everyone at some time around dusk, will sometimes struggle to see a low contrast fast moving hard object. That's not safe or fair.

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Citation: We need to ditch the pink ball in day-night test cricket (2015, December 17) retrieved 19 September 2024 from <https://medicalxpress.com/news/2015-12-ditch-pink-ball-day-night-cricket.html>

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