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## UFO UpDates Mailing List

### Re: Kenneth Arnold's testimony

From: Bruce Maccabee <brumac@compuserve.com>  
Date: Thu, 4 Dec 1997 00:39:13 -0500  
Fwd Date: Thu, 04 Dec 1997 10:08:47 -0500  
Subject: Re: Kenneth Arnold's testimony

Date: Wed, 03 Dec 1997 13:39:08 -0800  
From: Ted Viens <drtedv@freewwwweb.com>  
To: UFO UpDates - Toronto <updates@globalserve.net>  
Subject: Re: UFO UpDate: Re: Kenneth Arnold's testimony

> Date: Tue, 2 Dec 1997 21:19:34 -0500  
> From: James Easton <pulsar@compuserve.com>  
> Subject: UFO UpDate: Re: Kenneth Arnold's testimony  
> To: UFO UpDates - Toronto <updates@globalserve.net>

>James fails to do his homework. The glider pilot says that he  
>can distinguish a pelican up to four miles away and observe them  
>past six miles with his average unaided eyes. Is the pilot a  
>good judge of distance? Although a pelican's wing span may  
>exceed 10 feet. At a distance, averaging its cross-section, it  
>would be a fluctuating blob about 5 feet across. At 4 miles, it  
>would have an angular diameter of about 0 degrees 0 minutes 49  
>seconds. The receptor cells in the eye have an angular diameter  
>of 0 degrees 1 minute plus or minus. Even at 4 miles, the  
>pelican is a teeny weency dot. To identify a big bird it would  
>have to eclipse an area of the retina of some 10 by 10 cells or  
>so having an angular diameter of +- 10 minutes. This would place  
>a pelican LESS than 1/2 mile away or 1/8 of the distance claimed  
>by the pilot of the glider. If James would do some basic  
>science, he would understand the treachery of static estimation  
>of distance. And he certainly would have refrained from the  
>embarrassment of submitting the pilots story as supporting  
evidence.

Good point, Ted. The spacing between receptors (cones) in the eye is about 2.5 microns. With a 17 mm effective focal length the angular spacing is about 0.147 milliradians. With 17.4 mr/degree, the angular spacing between receptors is about 0.147/17.4 = 0.008 deg or about 1/2 minute. Anything smaller than that could get lost between receptors. Projecting the spacing 0.147 mr out to 5 miles gives about 4 ft in cross-section perpendicular to the line of sight. Anything smaller than this would be barely detectable. The typical eye can determine shape, i.e., resolve two things next to each other, if they are about 2 arc minutes apart or 1/30 degree or about 0.6 mr, which is about 4 times the receptor spacing. Projecting 0.6 mr out to 5 miles yields about 16 ft. Mighty large for a pelican. Arnold would be seeing wings mostly on edge so the 10 foot span might not be as important for viewing unless he were directly behind them. If we imagine that the body of the pelican is what Arnold would see, "modulated" by the flapping wings, and assign a 2 ft size to the

body, then to be resolved with some accuracy (Arnold did say he could see a shape), then 0.6 mr corresponds to 2 ft at 3300 ft, or less than a mile.

Suppose we let them be a mile away so that Arnold couldn't quite resolve their body shapes (and see wings beating). The UFOs crossed about 60 degrees of view in about 100 seconds, or about 0.6 deg/sec or 10 mr/sec. Project this to a mile and get 0.01 miles per sec or 36 miles per hour.

(a) can pelicans fly this fast at an altitude of about 9000 ft?

(b) when Arnold turned his plane to fly generally parallel to the track he would have noticed the speed difference

(c) as pointed out below, the parallax effect due to Arnold's high speed relative to pelicans only one mile away should have been immediately obvious as Arnold flew along (as opposed to the much smaller parallax effect of objects 20 miles away).

>A variation of these arguments apply to the bird watcher's  
>observations. Depth perception is aided not only by having two  
>eyes, but also by the motion of the observer causing movement of  
>the object against a distant background. In fact human depth  
>perception from stereoscopic vision is only good to a hundred  
>meters or so. Beyond that, we estimate distance by moving our  
>heads about, judging the relative motion of one object against  
>another. Most bird watchers that I am aware of definitely do NOT  
>bounce around some meter or so while watching birds. As static  
>observers, they are easily "baffled by optical illusions of  
>distance." Arnold was not a static observer nor an inept  
>dilettante pilot. As I have written before, any modest motion of  
>a meter or so of Arnold's plane PERPENDICULAR to the geometric  
>plane of their flight paths would have made it easier to  
>distinguish big birds near the plane from big flying craft closer  
>to the mountains. Arnold did have a convenient and familiar tool  
>for crudely judging distance that a static observer would not  
>have.

>Again I find myself in awe of Bruce Maccabee for being so patient  
>with another person who is arguing so poorly. It would be  
>difficult for me to repeatedly cover the same points with another  
>person.

(blush) OK, I admit it. I'm a truly "awesome" person <G>.  
However, I must admit that even my patience is wearing thin.  
And I can hardly wait for the debate over the Klass-Davidson  
meteor theory to begin.

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